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(57) Abstract			
This invention relates to novel human polynucleotides and variants thereof, their encoded polypeptides and variants thereof, to genes corresponding to these polynucleotides and to proteins expressed by the genes. The invention also relates to diagnostic and therapeutic agents employing such novel human polynucleotides, their corresponding genes or gene products, e.g., these genes and proteins, including probes, antisense constructs, and antibodies.			

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NOVEL HUMAN GENES AND GENE EXPRESSION PRODUCTS ICross-References to Related Applications

5 This application is a continuation-in-part of U.S. provisional patent application serial no. 60/068,755, filed December 23, 1997, and of U.S. provisional patent application serial no. 60/080,664, filed April 3, 1998, and of U.S. provisional patent application serial no. 60/105,234, filed October 21, 1998, each of which applications are incorporated herein by reference.

10 Field of the Invention

The present invention relates to novel polynucleotides, particularly to novel polynucleotides of human origin that are expressed in a selected cell type, are differentially expressed in one cell type relative to another cell type (*e.g.*, in cancerous cells, or in cells of a specific tissue origin) and/or share homology to polynucleotides encoding a gene product
15 having an identified functional domain and/or activity.

Background of the Invention

Identification of novel polynucleotides, particularly those that encode an expressed gene product, is important in the advancement of drug discovery, diagnostic technologies,
20 and the understanding of the progression and nature of complex diseases such as cancer. Identification of genes expressed in different cell types isolated from sources that differ in disease state or stage, developmental stage, exposure to various environmental factors, the tissue of origin, the species from which the tissue was isolated, and the like is key to identifying the genetic factors that are responsible for the phenotypes associated with these
25 various differences

This invention provides novel human polynucleotides, the polypeptides encoded by these polynucleotides, and the genes and proteins corresponding to these novel polynucleotides.

30 Summary of the Invention

This invention relates to novel human polynucleotides and variants thereof, their encoded polypeptides and variants thereof, to genes corresponding to these polynucleotides

and to proteins expressed by the genes. The invention also relates to diagnostic and therapeutic agents employing such novel human polynucleotides, their corresponding genes or gene products, *e.g.*, these genes and proteins, including probes, antisense constructs, and antibodies.

5 Accordingly, in one embodiment, the present invention features a library of polynucleotides, the library comprising the sequence information of at least one of SEQ ID NOS:1-844. In related aspects, the invention features a library provided on a nucleic acid array, or in a computer-readable format.

10 In one embodiment, the library is comprises a differentially expressed polynucleotide comprising a sequence selected from the group consisting of SEQ ID NOS:9, 39, 42, 52, 62, 74, 119, 172, 317, and 379. In specific related embodiments, the library comprises: 1) a polynucleotide that is differentially expressed in a human breast cancer cell, where the polynucleotide comprises a sequence selected from the group consisting of SEQ ID NOS: 4, 9, 39, 42, 52, 62, 65, 66, 68, 74, 81, 114, 123, 144, 130, 157, 162, 172, 178, 183, 202, 214, 15 219, 223, 258, 298, 317, 338, 379, 384, 386, and 388; 2) a polynucleotide differentially expressed in a human colon cancer cell, where the polynucleotide comprises a sequence selected from the group consisting of SEQ ID NOS: 1, 39, 52, 97, 119, 134, 172, 176, 241, 288, 317, 357, 362, and 374; or 3) a polynucleotide differentially expressed in a human lung cancer cell, where the polynucleotide comprises a sequence selected from the group 20 consisting of SEQ ID NOS: 9, 34, 42, 62, 74, 106, 119, 135, 154, 160, 260, 308, 323, 349, 361, 369, 371, 379, 395, 381, and 400.

 In another aspect, the invention features an isolated polynucleotide comprising a nucleotide sequence having at least 90% sequence identity to an identifying sequence of SEQ ID NOS:1-844 or a degenerate variant thereof. In related aspects, the 25 invention features recombinant host cells and vectors comprising the polynucleotides of the invention, as well as isolated polypeptides encoded by the polynucleotides of the invention and antibodies that specifically bind such polypeptides.

 In one embodiment, the invention features an isolated polynucleotide comprising a sequence encoding a polypeptide of a protein family selected from the group consisting of: 30 4 transmembrane segments integral membrane proteins, 7 transmembrane receptors, ATPases associated with various cellular activities (AAA), eukaryotic aspartyl proteases,

GATA family of transcription factors, G-protein alpha subunit, phorbol esters/diacylglycerol binding proteins, protein kinase, protein phosphatase 2C, protein tyrosine phosphatase, trypsin, wnt family of developmental signaling proteins, and WW/rsp5/WWP domain containing proteins. In a specific related embodiment, the invention features a

- 5 polynucleotide comprising a sequence of one of SEQ ID NOS: 24, 41, 101, 157, 291, 305, 315, 341, 63, 116, 134, 136, 151, 384, 404, 308, 213, 367, 188, 251, 202, 315, 367, 397, 256, 382, 169, 23, 291, 324, 330, 341, 353, 188, 379, and 395.

- In another embodiment, the invention features a polynucleotide comprising a sequence encoding a polypeptide having a functional domain selected from the group consisting of: Ank repeat, basic region plus leucine zipper transcription factors, 10 bromodomain, EF-hand, SH3 domain, WD domain/G-beta repeats, zinc finger (C2H2 type), zinc finger (CCHC class), and zinc-binding metalloprotease domain. In a specific related embodiment, the invention features a polynucleotide comprising a sequence of one of SEQ ID NOS: 116, 251, 374, 97, 136, 242, 379, 306, 386, 18, 335, 61, 306, 386, 322, 306, and 15 395.

- In another aspect, the invention features a method of detecting differentially expressed genes correlated with a cancerous state of a mammalian cell, where the method comprises the step of detecting at least one differentially expressed gene product in a test sample derived from a cell suspected of being cancerous, where the gene product is encoded 20 by a gene corresponding to a sequence of at least one of SEQ ID NOS: 4, 9, 39, 42, 52, 62, 65, 66, 68, 74, 81, 114, 123, 144, 130, 157, 162, 172, 178, 183, 202, 214, 219, 223, 258, 298, 317, 338, 379, 384, 386, 388, 1, 39, 52, 97, 119, 134, 172, 176, 241, 288, 317, 357, 362, 374, 9, 34, 42, 62, 74, 106, 119, 135, 154, 160, 260, 308, 323, 349, 361, 369, 371, 379, 395, 381, and 400. Detection of the differentially expressed gene product is correlated with a 25 cancerous state of the cell from which the test sample was derived. In one embodiment, the detecting is by hybridization of the test sample to a reference array, wherein the reference array comprises an identifying sequence of at least one of SEQ ID NOS: 1-844.

- In one embodiment of the method of the invention, the cell is a breast tissue derived cell, and the differentially expressed gene product is encoded by a gene corresponding to a 30 sequence of at least one of SEQ ID NOS: 4, 9, 39, 42, 52, 62, 65, 66, 68, 74, 81, 114, 123,

In another embodiment of the method of the invention, the cell is a colon tissue derived cell, and differentially expressed gene product is encoded by a gene corresponding to
5 a sequence of at least one of SEQ ID NOS: 1, 39, 52, 97, 119, 134, 172, 176, 241, 288, 317, 357, 362, and 374.

In yet another embodiment of the method of the invention, the cell is a lung tissue derived cell, and differentially expressed gene product is encoded by a gene corresponding to a sequence of at least one of SEQ ID NOS: 9, 34, 42, 62, 74, 106, 119, 135, 154, 160, 260,
10 308, 323, 349, 361, 369, 371, 379, 395, 381, and 400.

Other aspects and embodiments of the invention will be readily apparent to the ordinarily skilled artisan upon reading the description provided herein.

Detailed Description of the Invention

15 The invention relates to polynucleotides comprising the disclosed nucleotide sequences, to full length cDNA, mRNA and genes corresponding to these sequences, and to polypeptides and proteins encoded by these polynucleotides and genes.

Also included are polynucleotides that encode polypeptides and proteins encoded by the polynucleotides of the Sequence Listing. The various polynucleotides that can encode
20 these polypeptides and proteins differ because of the degeneracy of the genetic code, in that most amino acids are encoded by more than one triplet codon. The identity of such codons is well-known in this art, and this information can be used for the construction of the polynucleotides within the scope of the invention.

Polynucleotides encoding polypeptides and proteins that are variants of the
25 polypeptides and proteins encoded by the polynucleotides and related cDNA and genes are also within the scope of the invention. The variants differ from wild type protein in having one or more amino acid substitutions that either enhance, add, or diminish a biological activity of the wild type protein. Once the amino acid change is selected, a polynucleotide encoding that variant is constructed according to the invention.

30 The following detailed description describes the polynucleotide compositions encompassed by the invention, methods for obtaining cDNA or genomic DNA encoding a full-length gene product, expression of these polynucleotides and genes, identification of

structural motifs of the polynucleotides and genes, identification of the function of a gene product encoded by a gene corresponding to a polynucleotide of the invention, use of the provided polynucleotides as probes and in mapping and in tissue profiling, use of the corresponding polypeptides and other gene products to raise antibodies, and use of the
5 polynucleotides and their encoded gene products for therapeutic and diagnostic purposes.

I. Polynucleotide Compositions

The scope of the invention with respect to polynucleotide compositions includes, but is not necessarily limited to, polynucleotides having a sequence set forth in any one of SEQ ID
10 NOS:1-844; polynucleotides obtained from the biological materials described herein or other biological sources (particularly human sources) by hybridization under stringent conditions (particularly conditions of high stringency); genes corresponding to the provided polynucleotides; variants of the provided polynucleotides and their corresponding genes, particularly those variants that retain a biological activity of the encoded gene product (*e.g.*,
15 a biological activity ascribed to a gene product corresponding to the provided polynucleotides as a result of the assignment of the gene product to a protein family(ies) and/or identification of a functional domain present in the gene product). Other nucleic acid compositions contemplated by and within the scope of the present invention will be readily apparent to one of ordinary skill in the art when provided with the disclosure here.

20 The invention features polynucleotides that are expressed in cells of human tissue, specifically human colon, breast, and/or lung tissue. Novel nucleic acid compositions of the invention of particular interest comprise a sequence set forth in any one of SEQ ID NOS:1-844 or an identifying sequence thereof. An "identifying sequence" is a contiguous sequence of residues at least about 10 nt to about 20 nt in length, usually at least about 50 nt to about
25 100 nt in length, that uniquely identifies a polynucleotide sequence, *e.g.*, exhibits less than 90%, usually less than about 80% to about 85% sequence identity to any contiguous nucleotide sequence of more than about 20 nt. Thus, the subject novel nucleic acid compositions include full length cDNAs or mRNAs that encompass an identifying sequence of contiguous nucleotides from any one of SEQ ID NOS:1-844.

30 The polynucleotides of the invention also include polynucleotides having sequence similarity or sequence identity. Nucleic acids having sequence similarity are detected by

hybridization under low stringency conditions, for example, at 50°C and 10XSSC (0.9 M saline/0.09 M sodium citrate) and remain bound when subjected to washing at 55°C in 1XSSC. Sequence identity can be determined by hybridization under stringent conditions, for example, at 50°C or higher and 0.1XSSC (9 mM saline/0.9 mM sodium citrate).

- 5 Hybridization methods and conditions are well known in the art, see, *e.g.*, U.S. Patent No. 5,707,829. Nucleic acids that are substantially identical to the provided polynucleotide sequences, *e.g.* allelic variants, genetically altered versions of the gene, *etc.*, bind to the provided polynucleotide sequences (SEQ ID NOS:1-844) under stringent hybridization conditions. By using probes, particularly labeled probes of DNA sequences, one can isolate
- 10 homologous or related genes. The source of homologous genes can be any species, *e.g.* primate species, particularly human; rodents, such as rats and mice, canines, felines, bovines, ovines, equines, yeast, nematodes, *etc.*

- Preferably, hybridization is performed using at least 15 contiguous nucleotides of at least one of SEQ ID NOS: 1-844. That is, when at least 15 contiguous nucleotides of one of
- 15 the disclosed SEQ ID NOS. is used as a probe, the probe will preferentially hybridize with a gene or mRNA (of the biological material) comprising the complementary sequence, allowing the identification and retrieval of the nucleic acids of the biological material that uniquely hybridize to the selected probe. Probes from more than one SEQ ID NO. will hybridize with the same gene or mRNA if the cDNA from which they were derived
- 20 corresponds to one mRNA. Probes of more than 15 nucleotides can be used, but 15 nucleotides represents enough sequence for unique identification.

- The polynucleotides of the invention also include naturally occurring variants of the nucleotide sequences (*e.g.*, degenerate variants, allelic variants, *etc.*). Variants of the polynucleotides of the invention are identified by hybridization of putative variants with
- 25 nucleotide sequences disclosed herein, preferably by hybridization under stringent conditions. For example, by using appropriate wash conditions, variants of the polynucleotides of the invention can be identified where the allelic variant exhibits at most about 25-30% base pair mismatches relative to the selected polynucleotide probe. In general, allelic variants contain 15-25% base pair mismatches, and can contain as little as even 5-15%, or 2-5%, or 1-2%
- 30 base pair mismatches, as well as a single base-pair mismatch.

The invention also encompasses homologs corresponding to the polynucleotides of SEQ ID NOS:1-844, where the source of homologous genes can be any mammalian species, *e.g.*, primate species, particularly human; rodents, such as rats, canines, felines, bovines, ovines, equines, yeast, nematodes, etc. Between mammalian species, *e.g.*, human and
5 mouse, homologs have substantial sequence similarity, *e.g.*, at least 75% sequence identity, usually at least 90%, more usually at least 95% between nucleotide sequences. Sequence similarity is calculated based on a reference sequence, which may be a subset of a larger sequence, such as a conserved motif, coding region, flanking region, *etc.* A reference sequence will usually be at least about 18 contiguous nt long, more usually at least about 30
10 nt long, and may extend to the complete sequence that is being compared. Algorithms for sequence analysis are known in the art, such as BLAST, described in Altschul *et al.*, *J. Mol. Biol.* (1990) 215:403-10.

In general, variants of the invention have a sequence identity greater than at least about 65%, preferably at least about 75%, more preferably at least about 85%, and can be
15 greater than at least about 90% or more as determined by the Smith-Waterman homology search algorithm as implemented in MPSRCH program (Oxford Molecular). For the purposes of this invention, a preferred method of calculating percent identity is the Smith-Waterman algorithm, using the following. Global DNA sequence identity must be greater than 65% as determined by the Smith-Waterman homology search algorithm as implemented
20 in MPSRCH program (Oxford Molecular) using an affine gap search with the following search parameters: gap open penalty, 12; and gap extension penalty, 1.

The subject nucleic acids can be cDNAs or genomic DNAs, as well as fragments thereof, particularly fragments that encode a biologically active gene product and/or are useful in the methods disclosed herein (*e.g.*, in diagnosis, as a unique identifier of a
25 differentially expressed gene of interest, *etc.*). The term "cDNA" as used herein is intended to include all nucleic acids that share the arrangement of sequence elements found in native mature mRNA species, where sequence elements are exons and 3' and 5' non-coding regions. Normally mRNA species have contiguous exons, with the intervening introns, when present, being removed by nuclear RNA splicing, to create a continuous open reading
30 frame encoding a polypeptide of the invention.

A genomic sequence of interest comprises the nucleic acid present between the initiation codon and the stop codon, as defined in the listed sequences, including all of the introns that are normally present in a native chromosome. It can further include the 3 and 5 untranslated regions found in the mature mRNA. It can further include specific
5 transcriptional and translational regulatory sequences, such as promoters, enhancers, *etc.*, including about 1 kb, but possibly more, of flanking genomic DNA at either the 5 and 3 end of the transcribed region. The genomic DNA can be isolated as a fragment of 100 kbp or smaller; and substantially free of flanking chromosomal sequence. The genomic DNA flanking the coding region, either 3 and 5, or internal regulatory sequences as sometimes
10 found in introns, contains sequences required for proper tissue, stage-specific, or disease-state specific expression.

The nucleic acid compositions of the subject invention can encode all or a part of the subject differentially expressed polypeptides. Double or single stranded fragments can be obtained from the DNA sequence by chemically synthesizing oligonucleotides in accordance
15 with conventional methods, by restriction enzyme digestion, by PCR amplification, *etc.* Isolated polynucleotides and polynucleotide fragments of the invention comprise at least about 10, about 15, about 20, about 35, about 50, about 100, about 150 to about 200, about 250 to about 300, or about 350 contiguous nucleotides selected from the polynucleotide sequences as shown in SEQ ID NOS:1-844. For the most part, fragments will be of at least
20 15 nt, usually at least 18 nt or 25 nt, and up to at least about 50 contiguous nt in length or more. In a preferred embodiment, the polynucleotide molecules comprise a contiguous sequence of at least twelve nucleotides selected from the group consisting of the polynucleotides shown in SEQ ID NOS:1-844.

Probes specific to the polynucleotides of the invention can be generated using the
25 polynucleotide sequences disclosed in SEQ ID NOS:1-844. The probes are preferably at least about 12, 15, 16, 18, 20, 22, 24, or 25 nucleotide fragment of a corresponding contiguous sequence of SEQ ID NOS:1-844, and can be less than 2, 1, 0.5, 0.1, or 0.05 kb in length. The probes can be synthesized chemically or can be generated from longer polynucleotides using restriction enzymes. The probes can be labeled, for example, with a
30 radioactive, biotinylated, or fluorescent tag. Preferably, probes are designed based upon an identifying sequence of a polynucleotide of one of SEQ ID NOS:1-844. More preferably,

probes are designed based on a contiguous sequence of one of the subject polynucleotides that remain unmasked following application of a masking program for masking low complexity (*e.g.*, XBLAST) to the sequence., *i.e.*, one would select an unmasked region, as indicated by the polynucleotides outside the poly-n stretches of the masked sequence
5 produced by the masking program.

The polynucleotides of the subject invention are isolated and obtained in substantial purity, generally as other than an intact chromosome. Usually, the polynucleotides, either as DNA or RNA, will be obtained substantially free of other naturally-occurring nucleic acid sequences, generally being at least about 50%, usually at least about 90% pure and are
10 typically "recombinant", *e.g.*, flanked by one or more nucleotides with which it is not normally associated on a naturally occurring chromosome.

The polynucleotides of the invention can be provided as a linear molecule or within a circular molecule. They can be provided within autonomously replicating molecules (vectors) or within molecules without replication sequences. They can be regulated by their
15 own or by other regulatory sequences, as is known in the art. The polynucleotides of the invention can be introduced into suitable host cells using a variety of techniques which are available in the art, such as transferrin polycation-mediated DNA transfer, transfection with naked or encapsulated nucleic acids, liposome-mediated DNA transfer, intracellular transportation of DNA-coated latex beads, protoplast fusion, viral infection, electroporation,
20 gene gun, calcium phosphate-mediated transfection, and the like.

The subject nucleic acid compositions can be used to, for example, produce polypeptides, as probes for the detection of mRNA of the invention in biological samples (*e.g.*, extracts of human cells) to generate additional copies of the polynucleotides, to generate ribozymes or antisense oligonucleotides, and as single stranded DNA probes or as
25 triple-strand forming oligonucleotides. The probes described herein can be used to, for example, determine the presence or absence of the polynucleotide sequences as shown in SEQ ID NOS:1-844 or variants thereof in a sample. These and other uses are described in more detail below.

Use of Polynucleotides to Obtain Full-Length cDNA and Full-Length Human Gene and Promoter Region

Full-length cDNA molecules comprising the disclosed polynucleotides are obtained as follows. A polynucleotide having a sequence of one of SEQ ID NOS:1-844, or a portion thereof comprising at least 12, 15, 18, or 20 nucleotides, is used as a hybridization probe to detect hybridizing members of a cDNA library using probe design methods, cloning methods, and clone selection techniques such as those described in U.S. Patent No. 5,654,173. Libraries of cDNA are made from selected tissues, such as normal or tumor tissue, or from tissues of a mammal treated with, for example, a pharmaceutical agent. Preferably, the tissue is the same as the tissue from which the polynucleotides of the invention were isolated, as both the polynucleotides described herein and the cDNA represent expressed genes. Most preferably, the cDNA library is made from the biological material described herein in the Examples. Alternatively, many cDNA libraries are available commercially. (Sambrook *et al.*, *Molecular Cloning: A Laboratory Manual*, 2nd Ed., (1989) Cold Spring Harbor Press, Cold Spring Harbor, NY). The choice of cell type for library construction can be made after the identity of the protein encoded by the gene corresponding to the polynucleotide of the invention is known. This will indicate which tissue and cell types are likely to express the related gene, and thus represent a suitable source for the mRNA for generating the cDNA. Where the provided polynucleotides are isolated from cDNA libraries, the libraries are prepared from mRNA of human colon cells, more preferably, human colon cancer cells, even more preferably, from a highly metastatic colon cell, Km12L4-A.

Techniques for producing and probing nucleic acid sequence libraries are described, for example, in Sambrook *et al.*, *Molecular Cloning: A Laboratory Manual*, 2nd Ed., (1989) Cold Spring Harbor Press, Cold Spring Harbor, NY. The cDNA can be prepared by using primers based on sequence from SEQ ID NOS:1-844. In one embodiment, the cDNA library can be made from only poly-adenylated mRNA. Thus, poly-T primers can be used to prepare cDNA from the mRNA.

Members of the library that are larger than the provided polynucleotides, and preferably that encompass the complete coding sequence of the native message, are obtained. In order to confirm that the entire cDNA has been obtained, RNA protection experiments

are performed as follows. Hybridization of a full-length cDNA to an mRNA will protect the RNA from RNase degradation. If the cDNA is not full length, then the portions of the mRNA that are not hybridized will be subject to RNase degradation. This is assayed, as is known in the art, by changes in electrophoretic mobility on polyacrylamide gels, or by
5 detection of released monoribonucleotides. Sambrook *et al.*, *Molecular Cloning: A Laboratory Manual, 2nd Ed.*, (1989) Cold Spring Harbor Press, Cold Spring Harbor, NY. In order to obtain additional sequences 5' to the end of a partial cDNA, 5' RACE (*PCR Protocols: A Guide to Methods and Applications*, (1990) Academic Press, Inc.) is performed.

Genomic DNA is isolated using the provided polynucleotides in a manner similar to
10 the isolation of full-length cDNAs. Briefly, the provided polynucleotides, or portions thereof, are used as probes to libraries of genomic DNA. Preferably, the library is obtained from the cell type that was used to generate the polynucleotides of the invention, but this is not essential. Most preferably, the genomic DNA is obtained from the biological material described herein in the Examples. Such libraries can be in vectors suitable for carrying large
15 segments of a genome, such as P1 or YAC, as described in detail in Sambrook *et al.*, 9.4-9.30. In addition, genomic sequences can be isolated from human BAC libraries, which are commercially available from Research Genetics, Inc., Huntsville, Alabama, USA, for example. In order to obtain additional 5' or 3' sequences, chromosome walking is performed, as described in Sambrook *et al.*, such that adjacent and overlapping fragments of genomic
20 DNA are isolated. These are mapped and pieced together, as is known in the art, using restriction digestion enzymes and DNA ligase.

Using the polynucleotide sequences of the invention, corresponding full-length genes can be isolated using both classical and PCR methods to construct and probe cDNA libraries. Using either method, Northern blots, preferably, are performed on a number of cell types to
25 determine which cell lines express the gene of interest at the highest level. Classical methods of constructing cDNA libraries are taught in Sambrook *et al.*, *supra*. With these methods, cDNA can be produced from mRNA and inserted into viral or expression vectors. Typically, libraries of mRNA comprising poly(A) tails can be produced with poly(T) primers. Similarly, cDNA libraries can be produced using the instant sequences as primers.

30 PCR methods are used to amplify the members of a cDNA library that comprise the desired insert. In this case, the desired insert will contain sequence from the full length

cDNA that corresponds to the instant polynucleotides. Such PCR methods include gene trapping and RACE methods. Gene trapping entails inserting a member of a cDNA library into a vector. The vector then is denatured to produce single stranded molecules. Next, a substrate-bound probe, such a biotinylated oligo, is used to trap cDNA inserts of interest.

- 5 Biotinylated probes can be linked to an avidin-bound solid substrate. PCR methods can be used to amplify the trapped cDNA. To trap sequences corresponding to the full length genes, the labeled probe sequence is based on the polynucleotide sequences of the invention. Random primers or primers specific to the library vector can be used to amplify the trapped cDNA. Such gene trapping techniques are described in Gruber *et al.*, WO 95/04745 and
- 10 Gruber *et al.*, U.S. Pat. No. 5,500,356. Kits are commercially available to perform gene trapping experiments from, for example, Life Technologies, Gaithersburg, Maryland, USA.

- “Rapid amplification of cDNA ends,” or RACE, is a PCR method of amplifying cDNAs from a number of different RNAs. The cDNAs are ligated to an oligonucleotide linker, and amplified by PCR using two primers. One primer is based on sequence from the
- 15 instant polynucleotides, for which full length sequence is desired, and a second primer comprises sequence that hybridizes to the oligonucleotide linker to amplify the cDNA. A description of this methods is reported in WO 97/19110. In preferred embodiments of RACE, a common primer is designed to anneal to an arbitrary adaptor sequence ligated to cDNA ends (Apte and Siebert, *Biotechniques* (1993) 15:890-893; Edwards *et al.*, *Nuc. Acids*
- 20 *Res.* (1991) 19:5227-5232). When a single gene-specific RACE primer is paired with the common primer, preferential amplification of sequences between the single gene specific primer and the common primer occurs. Commercial cDNA pools modified for use in RACE are available.

- Another PCR-based method generates full-length cDNA library with anchored ends
- 25 without needing specific knowledge of the cDNA sequence. The method uses lock-docking primers (I-VI), where one primer, poly TV (I-III) locks over the polyA tail of eukaryotic mRNA producing first strand synthesis and a second primer, polyGH (IV-VI) locks onto the polyC tail added by terminal deoxynucleotidyl transferase (TdT). This method is described in WO 96/40998.

- 30 The promoter region of a gene generally is located 5' to the initiation site for RNA polymerase II. Hundreds of promoter regions contain the “TATA” box, a sequence such as

TATTA or TATAA, which is sensitive to mutations. The promoter region can be obtained by performing 5' RACE using a primer from the coding region of the gene. Alternatively, the cDNA can be used as a probe for the genomic sequence, and the region 5' to the coding region is identified by "walking up." If the gene is highly expressed or differentially expressed, the promoter from the gene can be of use in a regulatory construct for a heterologous gene.

Once the full-length cDNA or gene is obtained, DNA encoding variants can be prepared by site-directed mutagenesis, described in detail in Sambrook *et al.*, 15.3-15.63. The choice of codon or nucleotide to be replaced can be based on disclosure herein on optional changes in amino acids to achieve altered protein structure and/or function.

As an alternative method to obtaining DNA or RNA from a biological material, nucleic acid comprising nucleotides having the sequence of one or more polynucleotides of the invention can be synthesized. Thus, the invention encompasses nucleic acid molecules ranging in length from 15 nucleotides (corresponding to at least 15 contiguous nucleotides of one of SEQ ID NOS: 1-844) up to a maximum length suitable for one or more biological manipulations, including replication and expression, of the nucleic acid molecule. The invention includes but is not limited to (a) nucleic acid having the size of a full gene, and comprising at least one of SEQ ID NOS: 1-844; (b) the nucleic acid of (a) also comprising at least one additional gene, operably linked to permit expression of a fusion protein; (c) an expression vector comprising (a) or (b); (d) a plasmid comprising (a) or (b); and (e) a recombinant viral particle comprising (a) or (b). Once provided with the polynucleotides disclosed herein, construction or preparation of (a) - (e) are well within the skill in the art.

The sequence of a nucleic acid comprising at least 15 contiguous nucleotides of at least any one of SEQ ID NOS: 1-844, preferably the entire sequence of at least any one of SEQ ID NOS: 1-844, is not limited and can be any sequence of A, T, G, and/or C (for DNA) and A, U, G, and/or C (for RNA) or modified bases thereof, including inosine and pseudouridine. The choice of sequence will depend on the desired function and can be dictated by coding regions desired, the intron-like regions desired, and the regulatory regions desired. Where the entire sequence of any one of SEQ ID NOS: 1-844 is within the nucleic acid, the nucleic acid obtained is referred to herein as a polynucleotide comprising the sequence of any one of SEQ ID NOS: 1-844.

II. Expression of Polypeptide Encoded by Full-Length cDNA or Full-Length Gene

The provided polynucleotide (*e.g.*, a polynucleotide having a sequence of one of SEQ ID NOS:1-844), the corresponding cDNA, or the full-length gene is used to express a partial or complete gene product.

Constructs of polynucleotides having sequences of SEQ ID NOS:1-844 can be generated synthetically. Alternatively, single-step assembly of a gene and entire plasmid from large numbers of oligodeoxyribonucleotides is described by, *e.g.*, Stemmer *et al.*, *Gene (Amsterdam)* (1995) 164(1):49-53. In this method, assembly PCR (the synthesis of long DNA sequences from large numbers of oligodeoxyribonucleotides (oligos)) is described. The method is derived from DNA shuffling (Stemmer, *Nature* (1994) 370:389-391), and does not rely on DNA ligase, but instead relies on DNA polymerase to build increasingly longer DNA fragments during the assembly process. For example, a 1.1-kb fragment containing the TEM-1 beta-lactamase-encoding gene (*bla*) can be assembled in a single reaction from a total of 56 oligos, each 40 nucleotides (nt) in length. The synthetic gene can be PCR amplified and cloned in a vector containing the tetracycline-resistance gene (*Tc-R*) as the sole selectable marker. Without relying on ampicillin (*Ap*) selection, 76% of the *Tc-R* colonies were *Ap-R*, making this approach a general method for the rapid and cost-effective synthesis of any gene.

Appropriate polynucleotide constructs are purified using standard recombinant DNA techniques as described in, for example, Sambrook *et al.*, *Molecular Cloning: A Laboratory Manual, 2nd Ed.*, (1989) Cold Spring Harbor Press, Cold Spring Harbor, NY, and under current regulations described in United States Dept. of HHS, National Institute of Health (NIH) Guidelines for Recombinant DNA Research. The gene product encoded by a polynucleotide of the invention is expressed in any expression system, including, for example, bacterial, yeast, insect, amphibian and mammalian systems. Suitable vectors and host cells are described in U.S. Patent No. 5,654,173.

Bacteria. Expression systems in bacteria include those described in Chang *et al.*, *Nature* (1978) 275:615; Goeddel *et al.*, *Nature* (1979) 281:544; Goeddel *et al.*, *Nucleic Acids Res.* (1980) 8:4057; EP 0 036,776; U.S. Patent No. 4,551,433; DeBoer *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1983) 80:21-25; and Siebenlist *et al.*, *Cell* (1980) 20:269.

Yeast. Expression systems in yeast include those described in Hinnen *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1978) 75:1929; Ito *et al.*, *J. Bacteriol.* (1983) 153:163; Kurtz *et al.*, *Mol. Cell. Biol.* (1986) 6:142; Kunze *et al.*, *J. Basic Microbiol.* (1985) 25:141; Gleeson *et al.*, *J. Gen. Microbiol.* (1986) 132:3459; Roggenkamp *et al.*, *Mol. Gen. Genet.* (1986) 202:302; Das *et al.*, *J. Bacteriol.* (1984) 158:1165; De Louvencourt *et al.*, *J. Bacteriol.* (1983) 154:737; Van den Berg *et al.*, *Bio/Technology* (1990) 8:135; Kunze *et al.*, *J. Basic Microbiol.* (1985) 25:141; Cregg *et al.*, *Mol. Cell. Biol.* (1985) 5:3376; U.S. Patent Nos. 4,837,148 and 4,929,555; Beach and Nurse, *Nature* (1981) 300:706; Davidow *et al.*, *Curr. Genet.* (1985) 10:380; Gaillardin *et al.*, *Curr. Genet.* (1985) 10:49; Ballance *et al.*, *Biochem. Biophys. Res. Commun.* (1983) 112:284-289; Tilburn *et al.*, *Gene* (1983) 26:205-221; Yelton *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1984) 81:1470-1474; Kelly and Hynes, *EMBO J.* (1985) 4:475479; EP 0 244,234; and WO 91/00357.

Insect Cells. Expression of heterologous genes in insects is accomplished as described in U.S. Patent No. 4,745,051; Friesen *et al.*, "The Regulation of Baculovirus Gene Expression", in: *The Molecular Biology Of Baculoviruses* (1986) (W. Doerfler, ed.); EP 0 127,839; EP 0 155,476; and Vlak *et al.*, *J. Gen. Virol.* (1988) 69:765-776; Miller *et al.*, *Ann. Rev. Microbiol.* (1988) 42:177; Carbonell *et al.*, *Gene* (1988) 73:409; Maeda *et al.*, *Nature* (1985) 315:592-594; Lebacq-Verheyden *et al.*, *Mol. Cell. Biol.* (1988) 8:3129; Smith *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1985) 82:8844; Miyajima *et al.*, *Gene* (1987) 58:273; and Martin *et al.*, *DNA* (1988) 7:99. Numerous baculoviral strains and variants and corresponding permissive insect host cells from hosts are described in Luckow *et al.*, *Bio/Technology* (1988) 6:47-55, Miller *et al.*, *Generic Engineering* (1986) 8:277-279, and Maeda *et al.*, *Nature* (1985) 315:592-594.

Mammalian Cells. Mammalian expression is accomplished as described in Dijkema *et al.*, *EMBO J.* (1985) 4:761, Gorman *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1982) 79:6777, Boshart *et al.*, *Cell* (1985) 41:521 and U.S. Patent No. 4,399,216. Other features of mammalian expression are facilitated as described in Ham and Wallace, *Meth. Enz.* (1979) 58:44, Barnes and Sato, *Anal. Biochem.* (1980) 102:255, U.S. Patent Nos. 4,767,704, 4,657,866, 4,927,762, 4,560,655, WO 90/103430, WO 87/00195, and U.S. RE 30,985.

Polynucleotide molecules comprising a polynucleotide sequence provided herein propagated by placing the molecule in a vector. Viral and non-viral vectors are used,

including plasmids. The choice of plasmid will depend on the type of cell in which propagation is desired and the purpose of propagation. Certain vectors are useful for amplifying and making large amounts of the desired DNA sequence. Other vectors are suitable for expression in cells in culture. Still other vectors are suitable for transfer and expression in cells in a whole animal or person. The choice of appropriate vector is well within the skill of the art. Many such vectors are available commercially. The partial or full-length polynucleotide is inserted into a vector typically by means of DNA ligase attachment to a cleaved restriction enzyme site in the vector. Alternatively, the desired nucleotide sequence can be inserted by homologous recombination in vivo. Typically this is accomplished by attaching regions of homology to the vector on the flanks of the desired nucleotide sequence. Regions of homology are added by ligation of oligonucleotides, or by polymerase chain reaction using primers comprising both the region of homology and a portion of the desired nucleotide sequence, for example.

The polynucleotides set forth in SEQ ID NOS:1-844 or their corresponding full-length polynucleotides are linked to regulatory sequences as appropriate to obtain the desired expression properties. These can include promoters (attached either at the 5' end of the sense strand or at the 3' end of the antisense strand), enhancers, terminators, operators, repressors, and inducers. The promoters can be regulated or constitutive. In some situations it may be desirable to use conditionally active promoters, such as tissue-specific or developmental stage-specific promoters. These are linked to the desired nucleotide sequence using the techniques described above for linkage to vectors. Any techniques known in the art can be used.

When any of the above host cells, or other appropriate host cells or organisms, are used to replicate and/or express the polynucleotides or nucleic acids of the invention, the resulting replicated nucleic acid, RNA, expressed protein or polypeptide, is within the scope of the invention as a product of the host cell or organism. The product is recovered by any appropriate means known in the art.

Once the gene corresponding to a selected polynucleotide is identified, its expression can be regulated in the cell to which the gene is native. For example, an endogenous gene of a cell can be regulated by an exogenous regulatory sequence as disclosed in U.S. Patent No. 5,641,670.

III. Identification of Functional and Structural Motifs of Novel Genes

A. Screening Polynucleotide Sequences and Amino Acid Sequences Against Publicly Available Databases

5 Translations of the nucleotide sequence of the provided polynucleotides, cDNAs or full genes can be aligned with individual known sequences. Similarity with individual sequences can be used to determine the activity of the polypeptides encoded by the polynucleotides of the invention. For example, sequences that show similarity with a chemokine sequence can exhibit chemokine activities. Also, sequences exhibiting similarity
10 with more than one individual sequence can exhibit activities that are characteristic of either or both individual sequences.

 The full length sequences and fragments of the polynucleotide sequences of the nearest neighbors can be used as probes and primers to identify and isolate the full length sequence corresponding to provided polynucleotides. The nearest neighbors can indicate a
15 tissue or cell type to be used to construct a library for the full-length sequences corresponding to the provided polynucleotides..

 Typically, a selected polynucleotide is translated in all six frames to determine the best alignment with the individual sequences. The sequences disclosed herein in the Sequence Listing are in a 5' to 3' orientation and translation in three frames can be sufficient
20 (with a few specific exceptions as described in the Examples). These amino acid sequences are referred to, generally, as query sequences, which will be aligned with the individual sequences. Databases with individual sequences are described in "Computer Methods for Macromolecular Sequence Analysis" *Methods in Enzymology* (1996) 266, Doolittle, Academic Press, Inc., a division of Harcourt Brace & Co., San Diego, California, USA.
25 Databases include Genbank, EMBL, and DNA Database of Japan (DDBJ).

 Query and individual sequences can be aligned using the methods and computer programs described above, and include BLAST, available over the world wide web at <http://www.ncbi.nlm.nih.gov/BLAST/>. Another alignment algorithm is Fasta, available in the Genetics Computing Group (GCG) package, Madison, Wisconsin, USA, a wholly owned
30 subsidiary of Oxford Molecular Group, Inc. Other techniques for alignment are described in Doolittle, *supra*. Preferably, an alignment program that permits gaps in the sequence is

utilized to align the sequences. The Smith-Waterman is one type of algorithm that permits gaps in sequence alignments. See *Meth. Mol. Biol.* (1997) 70: 173-187. Also, the GAP program using the Needleman and Wunsch alignment method can be utilized to align sequences. An alternative search strategy uses MPSRCH software, which runs on a

5 MASPAR computer. MPSRCH uses a Smith-Waterman algorithm to score sequences on a massively parallel computer. This approach improves ability to identify sequences that are distantly related matches, and is especially tolerant of small gaps and nucleotide sequence errors. Amino acid sequences encoded by the provided polynucleotides can be used to search both protein and DNA databases.

10 Results of individual and query sequence alignments can be divided into three categories, high similarity, weak similarity, and no similarity. Individual alignment results ranging from high similarity to weak similarity provide a basis for determining polypeptide activity and/or structure. Parameters for categorizing individual results include: percentage of the alignment region length where the strongest alignment is found, percent sequence

15 identity, and p value.

The percentage of the alignment region length is calculated by counting the number of residues of the individual sequence found in the region of strongest alignment, *e.g.*, contiguous region of the individual sequence that contains the greatest number of residues that are identical to the residues of the corresponding region of the aligned query sequence.

20 This number is divided by the total residue length of the query sequence to calculate a percentage. For example, a query sequence of 20 amino acid residues might be aligned with a 20 amino acid region of an individual sequence. The individual sequence might be identical to amino acid residues 5, 9-15, and 17-19 of the query sequence. The region of strongest alignment is thus the region stretching from residue 9-19, an 11 amino acid stretch.

25 The percentage of the alignment region length is: 11 (length of the region of strongest alignment) divided by (query sequence length) 20 or 55%.

Percent sequence identity is calculated by counting the number of amino acid matches between the query and individual sequence and dividing total number of matches by the number of residues of the individual sequences found in the region of strongest

30 alignment. Thus, the percent identity in the example above would be 10 matches divided by 11 amino acids, or approximately, 90.9%

P value is the probability that the alignment was produced by chance. For a single alignment, the p value can be calculated according to Karlin *et al.*, *Proc. Natl. Acad. Sci.* (1990) 87:2264 and Karlin *et al.*, *Proc. Natl. Acad. Sci.* (1993) 90. The p value of multiple alignments using the same query sequence can be calculated using an heuristic approach
5 described in Altschul *et al.*, *Nat. Genet.* (1994) 6:119. Alignment programs such as BLAST program can calculate the p value.

Another factor to consider for determining identity or similarity is the location of the similarity or identity. Strong local alignment can indicate similarity even if the length of alignment is short. Sequence identity scattered throughout the length of the query sequence
10 also can indicate a similarity between the query and profile sequences. The boundaries of the region where the sequences align can be determined according to Doolittle, *supra*; BLAST or FAST programs; or by determining the area where sequence identity is highest.

High Similarity. In general, in alignment results considered to be of high similarity, the percent of the alignment region length is typically at least about 55% of total length
15 query sequence; more typically, at least about 58%; even more typically; at least about 60% of the total residue length of the query sequence. Usually, percent length of the alignment region can be as much as about 62%; more usually, as much as about 64%; even more usually, as much as about 66%. Further, for high similarity, the region of alignment, typically, exhibits at least about 75% of sequence identity; more typically, at least about
20 78%; even more typically; at least about 80% sequence identity. Usually, percent sequence identity can be as much as about 82%; more usually, as much as about 84%; even more usually, as much as about 86%.

The p value is used in conjunction with these methods. If high similarity is found, the query sequence is considered to have high similarity with a profile sequence when the p
25 value is less than or equal to about 10^{-2} ; more usually; less than or equal to about 10^{-3} ; even more usually; less than or equal to about 10^{-4} . More typically, the p value is no more than about 10^{-5} ; more typically; no more than or equal to about 10^{-10} ; even more typically; no more than or equal to about 10^{-15} for the query sequence to be considered high similarity.

Weak Similarity. In general, where alignment results considered to be of weak
30 similarity, there is no minimum percent length of the alignment region nor minimum length of alignment. A better showing of weak similarity is considered when the region of

alignment is, typically, at least about 15 amino acid residues in length; more typically, at least about 20; even more typically, at least about 25 amino acid residues in length. Usually, length of the alignment region can be as much as about 30 amino acid residues; more usually, as much as about 40; even more usually, as much as about 60 amino acid residues.

- 5 Further, for weak similarity, the region of alignment, typically, exhibits at least about 35% of sequence identity; more typically, at least about 40%; even more typically, at least about 45% sequence identity. Usually, percent sequence identity can be as much as about 50%; more usually, as much as about 55%; even more usually, as much as about 60%.

- 10 If low similarity is found, the query sequence is considered to have weak similarity with a profile sequence when the p value is usually less than or equal to about 10^{-2} ; more usually; less than or equal to about 10^{-3} ; even more usually; less than or equal to about 10^{-4} . More typically, the p value is no more than about 10^{-5} ; more usually; no more than or equal to about 10^{-10} ; even more usually; no more than or equal to about 10^{-15} for the query sequence to be considered weak similarity.

- 15 Similarity Determined by Sequence Identity Alone. Sequence identity alone can be used to determine similarity of a query sequence to an individual sequence and can indicate the activity of the sequence. Such an alignment, preferably, permits gaps to align sequences. Typically, the query sequence is related to the profile sequence if the sequence identity over the entire query sequence is at least about 15%; more typically, at least about 20%; even
20 more typically, at least about 25%; even more typically, at least about 50%. Sequence identity alone as a measure of similarity is most useful when the query sequence is usually, at least 80 residues in length; more usually, 90 residues; even more usually, at least 95 amino acid residues in length. More typically, similarity can be concluded based on sequence identity alone when the query sequence is preferably 100 residues in length; more preferably,
25 120 residues in length; even more preferably, 150 amino acid residues in length.

- Determining Activity from Alignments with Profile and Multiple Aligned Sequences. Translations of the provided polynucleotides can be aligned with amino acid profiles that define either protein families or common motifs. Also, translations of the provided polynucleotides can be aligned to multiple sequence alignments (MSA) comprising the
30 polypeptide sequences of members of protein families or motifs. Similarity or identity with profile sequences or MSAs can be used to determine the activity of the gene products (*e.g.*,

polypeptides) encoded by the provided polynucleotides or corresponding cDNA or genes. For example, sequences that show an identity or similarity with a chemokine profile or MSA can exhibit chemokine activities.

Profiles can be designed manually by (1) creating an MSA, which is an alignment of the amino acid sequence of members that belong to the family and (2) constructing a statistical representation of the alignment. Such methods are described, for example, in Birney *et al.*, *Nucl. Acid Res.* (1996) 24(14): 2730-2739. MSAs of some protein families and motifs are publicly available. For example, <http://genome.wustl.edu/Pfam/> includes MSAs of 547 different families and motifs. These MSAs are described also in Sonnhammer *et al.*, *Proteins* (1997) 28: 405-420. Other sources over the world wide web include the site at <http://www.embl-heidelberg.de/argos/ali/ali.html>; alternatively, a message can be sent to ALI@EMBL-HEIDELBERG.DE for the information. A brief description of these MSAs is reported in Pascarella *et al.*, *Prot. Eng.* (1996) 9(3):249-251. Techniques for building profiles from MSAs are described in Sonnhammer *et al.*, *supra*; Birney *et al.*, *supra*; and "Computer Methods for Macromolecular Sequence Analysis," *Methods in Enzymology* (1996) 266, Doolittle, Academic Press, Inc., a division of Harcourt Brace & Co., San Diego, California, USA.

Similarity between a query sequence and a protein family or motif can be determined by (a) comparing the query sequence against the profile and/or (b) aligning the query sequence with the members of the family or motif. Typically, a program such as Searchwise is used to compare the query sequence to the statistical representation of the multiple alignment, also known as a profile. The program is described in Birney *et al.*, *supra*. Other techniques to compare the sequence and profile are described in Sonnhammer *et al.*, *supra* and Doolittle, *supra*.

Next, methods described by Feng *et al.*, *J. Mol. Evol.* (1987) 25:351 and Higgins *et al.*, *CABIOS* (1989) 5:151 can be used to align the query sequence with the members of a family or motif, also known as a MSA. Computer programs, such as PILEUP, can be used. See Feng *et al.*, *infra*. In general, the following factors are used to determine if a similarity between a query sequence and a profile or MSA exists: (1) number of conserved residues found in the query sequence, (2) percentage of conserved residues found in the query sequence, (3) number of frameshifts, and (4) spacing between conserved residues.

Some alignment programs that both translate and align sequences can make any number of frameshifts when translating the nucleotide sequence to produce the best alignment. The fewer frameshifts needed to produce an alignment, the stronger the similarity or identity between the query and profile or MSAs. For example, a weak
5 similarity resulting from no frameshifts can be a better indication of activity or structure of a query sequence, than a strong similarity resulting from two frameshifts. Preferably, three or fewer frameshifts are found in an alignment; more preferably two or fewer frameshifts; even more preferably, one or fewer frameshifts; even more preferably, no frameshifts are found in an alignment of query and profile or MSAs.

10 Conserved residues are those amino acids found at a particular position in all or some of the family or motif members. For example, most chemokines contain four conserved cysteines. Alternatively, a position is considered conserved if only a certain class of amino acids is found in a particular position in all or some of the family members. For example, the N-terminal position can contain a positively charged amino acid, such as lysine, arginine,
15 or histidine.

Typically, a residue of a polypeptide is conserved when a class of amino acids or a single amino acid is found at a particular position in at least about 40% of all class members; more typically, at least about 50%; even more typically, at least about 60% of the members. Usually, a residue is conserved when a class or single amino acid is found in at least about
20 70% of the members of a family or motif; more usually, at least about 80%; even more usually, at least about 90%; even more usually, at least about 95%.

A residue is considered conserved when three unrelated amino acids are found at a particular position in the some or all of the members; more usually, two unrelated amino acids. These residues are conserved when the unrelated amino acids are found at particular
25 positions in at least about 40% of all class member; more typically, at least about 50%; even more typically, at least about 60% of the members. Usually, a residue is conserved when a class or single amino acid is found in at least about 70% of the members of a family or motif; more usually, at least about 80%; even more usually, at least about 90%; even more usually, at least about 95%.

30 A query sequence has similarity to a profile or MSA when the query sequence comprises at least about 25% of the conserved residues of the profile or MSA; more usually,

at least about 30%; even more usually; at least about 40%. Typically, the query sequence has a stronger similarity to a profile sequence or MSA when the query sequence comprises at least about 45% of the conserved residues of the profile or MSA; more typically, at least about 50%; even more typically; at least about 55%.

5 B. Screening Polynucleotide and Amino Acid Sequences Against Protein Profiles

The identify and function of the gene that correlates to a polynucleotide described herein can be determined by screening the polynucleotides or their corresponding amino acid sequences against profiles of protein families. Such profiles focus on common structural
10 motifs among proteins of each family. Publicly available profiles are described above in Section IVA. Additional or alternative profiles are described below.

In comparing a novel polynucleotide with known sequences, several alignment tools are available. Examples include PileUp, which creates a multiple sequence alignment, and is described in Feng *et al.*, *J. Mol. Evol.* (1987) 25:351. Another method, GAP, uses the
15 alignment method of Needleman *et al.*, *J. Mol. Biol.* (1970) 48:443. GAP is best suited for global alignment of sequences. A third method, BestFit, functions by inserting gaps to maximize the number of matches using the local homology algorithm of Smith *et al.*, *Adv. Appl. Math.* (1981) 2:482. Exemplary protein profiles are provided below and in the examples.

20 Chemokines. Chemokines are a family of proteins that have been implicated in lymphocyte trafficking, inflammatory diseases, angiogenesis, hematopoiesis, and viral infection. See, for example, Rollins, *Blood* (1997) 90(3):909-928, and Wells *et al.*, *J. Leuk. Biol.* (1997) 61:545-550. U.S. Patent No. 5,605,817 discloses DNA encoding a chemokine expressed in fetal spleen. U.S. Patent No. 5,656,724 discloses chemokine-like proteins and
25 methods of use. U.S. Patent No. 5,602,008 discloses DNA encoding a chemokine expressed by liver.

Chemokine mutants are polypeptides having an amino acid sequence that possesses at least one amino acid substitution, addition, or deletion as compared to native chemokines. Fragments possess the same amino acid sequence of the native chemokines; mutants can
30 lack the amino and/or carboxyl terminal sequences. Fusions are mutants, fragments, or native chemokines that also include amino and/or carboxyl terminal amino acid extensions.

The number or type of the amino acid changes is not critical, nor is the length or number of the amino acid deletions, or amino acid extensions that are incorporated in the chemokines as compared to the native chemokine amino acid sequences. A polynucleotide encoding one of these variant polypeptides will retain at least about 80% amino acid identity with at least one known chemokine. Preferably, these polypeptides will retain at least about 85% amino acid sequence identity, more preferably, at least about 90%; even more preferably, at least about 95%. In addition, the variants exhibit at least 80%; preferably about 90%; more preferably about 95% of at least one activity exhibited by a native chemokine, which includes immunological, biological, receptor binding, and signal transduction functions.

Assays for chemotaxis relating to neutrophils are described in Walz *et al.*, *Biochem. Biophys. Res. Commun.* (1987) 149:755, Yoshimura *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1987) 84:9233, and Schroder *et al.*, *J. Immunol.* (1987) 139:3474; to lymphocytes, Larsen *et al.*, *Science* (1989) 243:1464, Carr *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1994) 91:3652; to tumor-infiltrating lymphocytes, Liao *et al.*, *J. Exp. Med.* (1995) 182:1301; to hematopoietic progenitors, Aiuti *et al.*, *J. Exp. Med.* (1997) 185:111; to monocytes, Valente *et al.*, *Biochem.* (1988) 27:4162; and to natural killer cells, Loetscher *et al.*, *J. Immunol.* (1996) 156:322, and Allavena *et al.*, *Eur. J. Immunol.* (1994) 24:3233.

Assays for determining the biological activity of attracting eosinophils are described in Dahinden *et al.*, *J. Exp. Med.* (1994) 179:751, Weber *et al.*, *J. Immunol.* (1995) 154:4166, and Noso *et al.*, *Biochem. Biophys. Res. Commun.* (1994) 200:1470; for attracting dendritic cells, Sozzani *et al.*, *J. Immunol.* (1995) 155:3292; for attracting basophils, in Dahinden *et al.*, *J. Exp. Med.* (1994) 179:751, Alam *et al.*, *J. Immunol.* (1994) 152:1298, Alam *et al.*, *J. Exp. Med.* (1992) 176:781; and for activating neutrophils, Maghazaci *et al.*, *Eur. J. Immunol.* (1996) 26:315, and Taub *et al.*, *J. Immunol.* (1995) 155:3877. Native chemokines can act as mitogens for fibroblasts, assayed as described in Mullenbach *et al.*, *J. Biol. Chem.* (1986) 261:719.

Native chemokines exhibit binding activity with a number of receptors. Description of such receptors and assays to detect binding are described in, for example, Murphy *et al.*, *Science* (1991) 253:1280; Combadiere *et al.*, *J. Biol. Chem.* (1995) 270:29671; Daugherty *et al.*, *J. Exp. Med.* (1996) 183:2349; Samson *et al.*, *Biochem.* (1996) 35:3362; Raport *et al.*, *J.*

Biol. Chem. (1996) 271:17161; Combadiere *et al.*, *J. Leukoc. Biol.* (1996) 60:147; Baba *et al.*, *J. Biol. Chem.* (1997) 23:14893; Yosida *et al.*, *J. Biol. Chem.* (1997) 272:13803; Arvanitakis *et al.*, *Nature* (1997) 385:347, and other assays are known in the art.

Assays for kinase activation of chemokines are described by Yen *et al.*, *J. Leukoc. Biol.* (1997) 61:529; Dubois *et al.*, *J. Immunol.* (1996) 156:1356; Turner *et al.*, *J. Immunol.* (1995) 155:2437. Assays for inhibition of angiogenesis or cell proliferation are described in Maione *et al.*, *Science* (1990) 247:77. Glycosaminoglycan production can be induced by native chemokines, assayed as described in Castor *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1983) 80:765. Chemokine-mediated histamine release from basophils is assayed as described in Dahinden *et al.*, *J. Exp. Med.* (1989) 170:1787; and White *et al.*, *Immunol. Lett.* (1989) 22:151. Heparin binding is described in Luster *et al.*, *J. Exp. Med.* (1995) 182:219.

Chemokines can possess dimerization activity, which can be assayed according to Burrows *et al.*, *Biochem.* (1994) 33:12741; and Zhang *et al.*, *Mol. Cell. Biol.* (1995) 15:4851. Native chemokines can play a role in the inflammatory response of viruses. This activity can be assayed as described in Bleul *et al.*, *Nature* (1996) 382:829; and Oberlin *et al.*, *Nature* (1996) 382:833. Exocytosis of monocytes can be promoted by native chemokines. The assay for such activity is described in Uguccioni *et al.*, *Eur. J. Immunol.* (1995) 25:64. Native chemokines also can inhibit hematopoietic stem cell proliferation. The method for testing for such activity is reported in Graham *et al.*, *Nature* (1990) 344:442.

Death Domain Proteins. Several protein families contain death domain motifs (Feinstein and Kimchi, *TIBS Letters* (1995) 20:242). Some death domain containing proteins are implicated in cytotoxic intracellular signaling (Cleveland *et al.*, *Cell* (1995) 81:479; Pan *et al.*, *Science* (1997) 276:111; Duan *et al.*, *Nature* (1997) 385:86-89, and Chinnaiyan *et al.*, *Science* (1996) 274:990). U.S. Patent No. 5,563,039 describes a protein homologous to TRADD (Tumor Necrosis Factor Receptor-1 Associated Death Domain containing protein), and modifications of the active domain of TRADD that retain the functional characteristics of the protein, as well as apoptosis assays for testing the function of such death domain containing proteins. U.S. Patent No. 5,658,883 discloses biologically active TGF- β 1 peptides. U.S. Patent No. 5,674,734 discloses RIP, which contains a C-terminal death domain and an N-terminal kinase domain.

Leukemia Inhibitory Factor (LIF). An LIF profile is constructed from sequences of leukemia inhibitor factor, CT-1 (cardiotrophin-1), CNTF (ciliary neurotrophic factor), OSM (oncostatin M), and IL-6 (interleukin-6). This profile encompasses a family of secreted cytokines that have pleiotropic effects on many cell types including hepatocytes, osteoclasts, neuronal cells and cardiac myocytes, and can be used to detect additional genes encoding such proteins. These molecules are all structurally related and share a common co-receptor gp130 which mediates intracellular signal transduction by cytoplasmic tyrosine kinases such as src.

Novel proteins related to this family are also likely to be secreted, to activate gp130 and to function in the development of a variety of cell types. Thus new members of this family would be candidates to be developed as growth or survival factors for the cell types that they stimulate. For more details on this family of cytokines, see Pennica *et al.*, *Cytokine and Growth Factor Reviews* (1996) 7:81-91. U.S. Patent No. 5,420,247 discloses LIF receptor and fusion proteins. U.S. Patent No. 5,443,825 discloses human LIF.

Angiopoietin. Angiopoietin-1 is a secreted ligand of the TIE-2 tyrosine kinase; it functions as an angiogenic factor critical for normal vascular development. Angiopoietin-2 is a natural antagonist of angiopoietin-1 and thus functions as an anti-angiogenic factor. These two proteins are structurally similar and activate the same receptor (Folkman *et al.*, *Cell* (1996) 87:1153, and Davis *et al.*, *Cell* (1996) 87:1161). The angiopoietin molecules are composed of two domains: a coiled-coil region and a region related to fibrinogen. The fibrinogen domain is found in many molecules including ficolin and tesascin, and is well defined structurally with many members.

Receptor Protein-Tyrosine Kinases. Receptor Protein-Tyrosine Kinases or RPTKs are described in Lindberg, *Annu. Rev. Cell Biol.* (1994) 10:251-337.

Growth Factors: (Epidermal Growth Factor) EGF and (Fibroblast Growth Factor) FGF. For a discussion of growth factor superfamilies, see *Growth Factors: A Practical Approach*, (Appendix A1) (1993) McKay and Leigh, Oxford University Press, NY, 237-243. U.S. Patent No. 4,444,760 discloses acidic brain fibroblast growth factor, which is active in the promotion of cell division and wound healing. U.S. Patent No. 5,439,818 discloses DNA encoding human recombinant basic fibroblast growth factor, which is active in wound healing. U.S. Patent No. 5,604,293 discloses recombinant human basic fibroblast growth

factor, which is useful for wound healing. U.S. Patent No. 5,410,832 discloses brain-derived and recombinant acidic fibroblast growth factor, which act as mitogens for mesoderm and neuroectoderm-derived cells in culture, and promote wound healing in soft tissue, cartilaginous tissue and musculo-skeletal tissue. U.S. Patent No. 5,387,673 discloses
5 biologically active fragments of FGF.

Proteins of the TNF Family. A profile derived from the TNF family is created by aligning sequences of the following TNF family members: nerve growth factor (NGF), lymphotoxin, Fas ligand, tumor necrosis factor (TNF α), CD40 ligand, TRAIL, ox40 ligand, 4-1BB ligand, CD27 ligand, and CD30 ligand. The profile is designed to identify sequences
10 of proteins that constitute new members or homologues of this family of proteins. U.S. Patent No. 5,606,023 discloses mutant TNF proteins; U.S. Patent No. 5,597,899 and U.S. Patent No. 5,486,463 disclose TNF muteins; and U.S. Patent No. 5,652,353 discloses DNA encoding TNF α muteins.

Members of the TNF family of proteins have been show in vitro to multimerize, as
15 described in Burrows *et al.*, *Biochem.* (1994) 33:12741 and Zhang *et al.*, *Mol. Cell. Biol.* (1995) 15:4851 and bind receptors as described in Browning *et al.*, *J. Immunol.* (1994) 147:1230, Androlewicz *et al.*, *J. Biol. Chem.*(1992) 267:2542, and Crowe *et al.*, *Science* (1994) 264:707.

In vivo, TNFs proteolytically cleave a target protein as described in Kriegel *et al.*,
20 *Cell* (1988) 53:45 and Mohler *et al.*, *Nature* (1994) 370:218 and demonstrate cell proliferation and differentiation activity. T-cell or thymocyte proliferation is assayed as described in Armitage *et al.*, *Eur. J. Immunol.* (1992) 22:447; Current Protocols in Immunology, ed. J.E. Coligan *et al.*, 3.1-3.19; Takai *et al.*, *J. Immunol.* (1986) 137:3494-3500, Bertagnoli *et al.*, *J. Immunol.* (1990) 145:1706, Bertagnoli *et al.*, *J. Immunol.* (1991)
25 133:327, Bertagnoli *et al.*, *J. Immunol.* (1992) 149:3778, and Bowman *et al.*, *J. Immunol.* (1994) 152:1756. B cell proliferation and Ig secretion are assayed as described in Maliszewski, *J. Immunol.* (1990) 144:3028, and Assays for B Cell Function: In Vitro Antibody Production, Mond and Brunswick, Current Protocols in Immunol., Coligan Ed vol 1 pp 3.8.1-3.8.16, John Wiley and Sons, Toronto 1994, Kehrl *et al.*, *Science* (1987) 238:1144
30 and Boussiotis *et al.*, *PNAS USA* (1994) 91:7007. Other in vivo activities include upregulation of cell surface antigens, upregulation of costimulatory molecules, and cellular.

aggregation/adhesion as described in Barrett *et al.*, *J. Immunol.* (1991) 146:1722; Bjorck *et al.*, *Eur. J. Immunol.* (1993) 23:1771; Clark *et al.*, *Annu Rev. Immunol.* (1991) 9:97; Ranheim *et al.*, *J. Exp. Med.* (1994) 177:925; Yellin, *J. Immunol.* (1994) 153:666; and Gruss *et al.*, *Blood* (1994) 84:2305.

- 5 Proliferation and differentiation of hematopoietic and lymphopoietic cells has also been shown in vivo for TNFs, using assays for embryonic differentiation and hematopoiesis as described in Johansson *et al.*, *Cellular Biology* (1995) 15:141, Keller *et al.*, *Mol. Cell. Biol.* (1993) 13:473, McClanahan *et al.*, *Blood* (1993) 81:2903 and using assays to detect stem cell survival and differentiation as described in Culture of Hematopoietic Cells, Freshney *et al.* eds, pp 1-21, 23-29, 139-162, 163-179, and 265-268, Wiley-Liss, Inc., New York, NY, 1994, and Hirajama *et al.*, *PNAS USA* (1992) 89:5907.

- In vivo activities of TNFs also include lymphocyte survival and apoptosis, assayed as described in Darzynkewicz *et al.*, *Cytometry* (1992) 13:795; Gorczca *et al.*, *Leukemia* (1993) 7:659; Itoh *et al.*, *Cell* (1991) 66:233; Zacharduk, *J. Immunol.* (1990) 145:4037; Zamai *et al.*, *Cytometry* (1993) 14:891; and Gorczyca *et al.*, *Int'l J. Oncol.* (1992) 1:639. Some members of the TNF family are cleaved from the cell surface; others remain membrane bound. The three-dimensional structure of TNF is discussed in Sprang and Eck, Tumor Necrosis Factors; *supra*.

- TNF proteins include a transmembrane domain. The protein is cleaved into a shorter soluble version, as described in Kriegler *et al.*, *Cell* (1988) 53:45, Perez *et al.*, *Cell* (1990) 63:251, and Shaw *et al.*, *Cell* (1986) 46:659. The transmembrane domain is between amino acid 46 and 77 and the cytoplasmic domain is between position 1 and 45 on the human form of TNF α . The 3-dimensional motifs of TNF include a sandwich of two pleated β sheets. Each sheet is composed of anti-parallel β strands. β strands facing each other on opposite sites of the sandwich are connected by short polypeptide loops, as described in Van Ostade *et al.*, *Protein Engineering* (1994) 7(1):5, and Sprang *et al.*, Tumor Necrosis Factors; *supra*. Residues of the TNF family proteins that are involved in the β sheet secondary structure have been identified as described in Van Ostade *et al.*, *Protein Eng.* (1994) 7(1):5, and Sprang *et al.*, *supra*.

- 30 TNF receptors are disclosed in U.S. Patent No. 5,395,760. A profile derived from the TNF receptor family is created by aligning sequences of the TNF receptor family, including

Apo1/Fas, TNFR I and II, death receptor 3 (DR3), CD40, ox40, CD27, and CD30. Thus, the profile is designed to identify from the polynucleotides of the invention sequences of proteins that constitute new members or homologues of this family of proteins.

Tumor necrosis factor receptors exist in two forms in humans: p55 TNFR and p75 TNFR, both of which provide intracellular signals upon binding with a ligand. The extracellular domains of these receptor proteins are cysteine rich. The receptors can remain membrane bound, although some forms of the receptors are cleaved forming soluble receptors. The regulation, diagnostic, prognostic, and therapeutic value of soluble TNF receptors is discussed in Aderka, *Cytokine and Growth Factor Reviews*, (1996) 7(3):231.

PDGF Family. U.S. Patent No. 5,326,695 discloses platelet derived growth factor agonists; bioactive portions of PDGF-B are used as agonists. U.S. Patent No. 4,845,075 discloses biologically active B-chain homodimers, and also includes variants and derivatives of the PDGF-B chain. U.S. Patent No. 5,128,321 discloses PDGF analogs and methods of use. Proteins having the same bioactivity as PDGF are disclosed, including A and B chain proteins.

Kinase (Including MKK) Family. U.S. Patent No. 5,650,501 discloses serine/threonine kinase, associated with mitotic and meiotic cell division; the protein has a kinase domain in its N-terminal and 3 PEST regions in the C-terminus. U.S. Patent No. 5,605,825 discloses human PAK65, a serine protein kinase.

The foregoing discussion provides a few examples of the protein profiles that can be compared with the polynucleotides of the invention. One skilled in the art can use these and other protein profiles to identify the genes that correlate with the provided polynucleotides.

C. Identification of Secreted & Membrane-Bound Polypeptides

Both secreted and membrane-bound polypeptides of the present invention are of particular interest. For example, levels of secreted polypeptides can be assayed in body fluids that are convenient, such as blood, urine, prostatic fluid and semen. Membrane-bound polypeptides are useful for constructing vaccine antigens or inducing an immune response. Such antigens would comprise all or part of the extracellular region of the membrane-bound polypeptides. Because both secreted and membrane-bound polypeptides comprise a fragment of contiguous hydrophobic amino acids, hydrophobicity predicting algorithms can be used to identify such polypeptides.

A signal sequence is usually encoded by both secreted and membrane-bound polypeptide genes to direct a polypeptide to the surface of the cell. The signal sequence usually comprises a stretch of hydrophobic residues. Such signal sequences can fold into helical structures. Membrane-bound polypeptides typically comprise at least one transmembrane region that possesses a stretch of hydrophobic amino acids that can transverse the membrane. Some transmembrane regions also exhibit a helical structure. Hydrophobic fragments within a polypeptide can be identified by using computer algorithms. Such algorithms include Hopp & Woods, *Proc. Natl. Acad. Sci. USA* (1981) 78:3824-3828; Kyte & Doolittle, *J. Mol. Biol.* (1982) 157: 105-132; and RAOAR algorithm, Degli Esposti *et al.*, *Eur. J. Biochem.* (1990) 190: 207-219.

Another method of identifying secreted and membrane-bound polypeptides is to translate the polynucleotides of the invention in all six frames and determine if at least 8 contiguous hydrophobic amino acids are present. Those translated polypeptides with at least 8; more typically, 10; even more typically, 12 contiguous hydrophobic amino acids are considered to be either a putative secreted or membrane bound polypeptide. Hydrophobic amino acids include alanine, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, threonine, tryptophan, tyrosine, and valine.

IV. Identification of the Function of an Expression Product of a Full-Length Gene Corresponding to a Polynucleotide

Ribozymes, antisense constructs, and dominant negative mutants can be used to determine function of the expression product of a gene corresponding to a polynucleotide provided herein. These methods and compositions are particularly useful where the provided novel polynucleotide exhibits no significant or substantial homology to a sequence encoding a gene of known function. Antisense molecules and ribozymes can be constructed from synthetic polynucleotides. Typically, the phosphoramidite method of oligonucleotide synthesis is used. See Beaucage *et al.*, *Tet. Lett.* (1981) 22:1859 and U.S. Patent No. 4,668,777. Automated devices for synthesis are available to create oligonucleotides using this chemistry. Examples of such devices include Biosearch 8600, Models 392 and 394 by Applied Biosystems, a division of Perkin-Elmer Corp., Foster City, California, USA; and Expedite by Perceptive Biosystems, Framingham, Massachusetts, USA. Synthetic RNA,

phosphate analog oligonucleotides, and chemically derivatized oligonucleotides can also be produced, and can be covalently attached to other molecules. RNA oligonucleotides can be synthesized, for example, using RNA phosphoramidites. This method can be performed on an automated synthesizer, such as Applied Biosystems, Models 392 and 394, Foster City,
5 California, USA. See Applied Biosystems User Bulletin 53 and Ogilvie *et al.*, *Pure & Applied Chem.* (1987) 59:325.

Phosphorothioate oligonucleotides can also be synthesized for antisense construction. A sulfurizing reagent, such as tetraethylthiuram disulfide (TETD) in acetonitrile can be used to convert the internucleotide cyanoethyl phosphite to the phosphorothioate triester within 15
10 minutes at room temperature. TETD replaces the iodine reagent, while all other reagents used for standard phosphoramidite chemistry remain the same. Such a synthesis method can be automated using Models 392 and 394 by Applied Biosystems, for example.

Oligonucleotides of up to 200 nucleotides can be synthesized, more typically, 100 nucleotides, more typically 50 nucleotides; even more typically 30 to 40 nucleotides. These
15 synthetic fragments can be annealed and ligated together to construct larger fragments. See, for example, Sambrook *et al.*, *supra*.

A. Ribozymes

Trans-cleaving catalytic RNAs (ribozymes) are RNA molecules possessing endoribonuclease activity. Ribozymes are specifically designed for a particular target, and
20 the target message must contain a specific nucleotide sequence. They are engineered to cleave any RNA species site-specifically in the background of cellular RNA. The cleavage event renders the mRNA unstable and prevents protein expression. Importantly, ribozymes can be used to inhibit expression of a gene of unknown function for the purpose of determining its function in an in vitro or in vivo context, by detecting the phenotypic effect.

25 One commonly used ribozyme motif is the hammerhead, for which the substrate sequence requirements are minimal. Design of the hammerhead ribozyme is disclosed in Usman *et al.*, *Current Opin. Struct. Biol.* (1996) 6:527. Usman also discusses the therapeutic uses of ribozymes. Ribozymes can also be prepared and used as described in Long *et al.*, *FASEB J.* (1993) 7:25; Symons, *Ann. Rev. Biochem.* (1992) 61:641; Perrotta *et al.*, *Biochem.* (1992) 31:16; Ojwang *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1992) 89:10802;
30 and U.S. Patent No. 5,254,678. Ribozyme cleavage of HIV-I RNA is described in U.S.

Patent No. 5,144,019; methods of cleaving RNA using ribozymes is described in U.S. Patent No. 5,116,742; and methods for increasing the specificity of ribozymes are described in U.S. Patent No. 5,225,337 and Koizumi *et al.*, *Nucleic Acid Res.* (1989) 17:7059. Preparation and use of ribozyme fragments in a hammerhead structure are also described by Koizumi *et al.*, *Nucleic Acids Res.* (1989) 17:7059. Preparation and use of ribozyme fragments in a hairpin structure are described by Chowrira and Burke, *Nucleic Acids Res.* (1992) 20:2835. Ribozymes can also be made by rolling transcription as described in Daubendiek and Kool, *Nat. Biotechnol.* (1997) 15(3):273.

The hybridizing region of the ribozyme can be modified or can be prepared as a branched structure as described in Horn and Urdea, *Nucleic Acids Res.* (1989) 17:6959. The basic structure of the ribozymes can also be chemically altered in ways familiar to those skilled in the art, and chemically synthesized ribozymes can be administered as synthetic oligonucleotide derivatives modified by monomeric units. In a therapeutic context, liposome mediated delivery of ribozymes improves cellular uptake, as described in Birikh *et al.*, *Eur. J. Biochem.* (1997) 245:1.

Using the polynucleotide sequences of the invention and methods known in the art, ribozymes are designed to specifically bind and cut the corresponding mRNA species. Ribozymes thus provide a means to inhibit the expression of any of the proteins encoded by the disclosed polynucleotides or their full-length genes. The full-length gene need not be known in order to design and use specific inhibitory ribozymes. In the case of a polynucleotide or full-length cDNA of unknown function, ribozymes corresponding to that nucleotide sequence can be tested in vitro for efficacy in cleaving the target transcript. Those ribozymes that effect cleavage in vitro are further tested in vivo. The ribozyme can also be used to generate an animal model for a disease, as described in Birikh *et al.*, *supra*. An effective ribozyme is used to determine the function of the gene of interest by blocking its transcription and detecting a change in the cell. Where the gene is found to be a mediator in a disease, an effective ribozyme is designed and delivered in a gene therapy for blocking transcription and expression of the gene.

Therapeutic and functional genomic applications of ribozymes proceed beginning with knowledge of a portion of the coding sequence of the gene to be inhibited. Thus, for many genes, a partial polynucleotide sequence provides adequate sequence for constructing

an effective ribozyme. A target cleavage site is selected in the target sequence, and a ribozyme is constructed based on the 5' and 3' nucleotide sequences that flank the cleavage site. Retroviral vectors are engineered to express monomeric and multimeric hammerhead ribozymes targeting the mRNA of the target coding sequence. These monomeric and multimeric ribozymes are tested in vitro for an ability to cleave the target mRNA. A cell line is stably transduced with the retroviral vectors expressing the ribozymes, and the transduction is confirmed by Northern blot analysis and reverse-transcription polymerase chain reaction (RT-PCR). The cells are screened for inactivation of the target mRNA by such indicators as reduction of expression of disease markers or reduction of the gene product of the target mRNA.

B. Antisense

Antisense nucleic acids are designed to specifically bind to RNA, resulting in the formation of RNA-DNA or RNA-RNA hybrids, with an arrest of DNA replication, reverse transcription or messenger RNA translation. Antisense polynucleotides based on a selected polynucleotide sequence can interfere with expression of the corresponding gene. Antisense polynucleotides are typically generated within the cell by expression from antisense constructs that contain the antisense strand as the transcribed strand. Antisense polynucleotides based on the disclosed polynucleotides will bind and/or interfere with the translation of mRNA comprising a sequence complementary to the antisense polynucleotide. The expression products of control cells and cells treated with the antisense construct are compared to detect the protein product of the gene corresponding to the polynucleotide upon which the antisense construct is based. The protein is isolated and identified using routine biochemical methods.

One rationale for using antisense methods to determine the function of the gene corresponding to a disclosed polynucleotide is the biological activity of antisense therapeutics. Antisense therapy for a variety of cancers is in clinical phase and has been discussed extensively in the literature. Reed reviewed antisense therapy directed at the Bcl-2 gene in tumors; gene transfer-mediated overexpression of Bcl-2 in tumor cell lines conferred resistance to many types of cancer drugs. (Reed, J.C., *N.C.I.* (1997) 89:988). The potential for clinical development of antisense inhibitors of *ras* is discussed by Cowser, L.M., *Anti-Cancer Drug Design* (1997) 12:359. Additional important antisense targets include

leukemia (Geurtz, A.M., *Anti-Cancer Drug Design* (1997) 12:341); human C-ref kinase (Monia, B.P., *Anti-Cancer Drug Design* (1997) 12:327); and protein kinase C (McGraw *et al.*, *Anti-Cancer Drug Design* (1997) 12:315).

Given the extensive background literature and clinical experience in antisense therapy, one skilled in the art can use selected polynucleotides of the invention as additional potential therapeutics. The choice of polynucleotide can be narrowed by first testing them for binding to "hot spot" regions of the genome of cancerous cells. If a polynucleotide is identified as binding to a "hot spot", testing the polynucleotide as an antisense compound in the corresponding cancer cells clearly is warranted.

Ogunbiyi *et al.*, *Gastroenterology* (1997) 113(3):761 describe prognostic use of allelic loss in colon cancer; Barks *et al.*, *Genes, Chromosomes, and Cancer* (1997) 19(4):278 describe increased chromosome copy number detected by FISH in malignant melanoma; Nishizake *et al.*, *Genes, Chromosomes, and Cancer* (1997) 19(4):267 describe genetic alterations in primary breast cancer and their metastases and direct comparison using modified comparative genome hybridization; and Elo *et al.*, *Cancer Research* (1997) 57(16):3356 disclose that loss of heterozygosity at 16z24.1-q24.2 is significantly associated with metastatic and aggressive behavior of prostate cancer.

C. Dominant Negative Mutations

As an alternative method for identifying function of the gene corresponding to a polynucleotide disclosed herein, dominant negative mutations are readily generated for corresponding proteins that are active as homomultimers. A mutant polypeptide will interact with wild-type polypeptides (made from the other allele) and form a non-functional multimer. Thus, a mutation is in a substrate-binding domain, a catalytic domain, or a cellular localization domain. Preferably, the mutant polypeptide will be overproduced.

Point mutations are made that have such an effect. In addition, fusion of different polypeptides of various lengths to the terminus of a protein can yield dominant negative mutants. General strategies are available for making dominant negative mutants (see, *e.g.*, Herskowitz, *Nature* (1987) 329:219). Such techniques can be used to create loss of function mutations, which are useful for determining protein function.

V. Construction of Polypeptides of the Invention and Variants Thereof

The polypeptides of the invention include those encoded by the disclosed polynucleotides. These polypeptides can also be encoded by nucleic acids that, by virtue of the degeneracy of the genetic code, are not identical in sequence to the disclosed polynucleotides. Thus, the invention includes within its scope a polypeptide encoded by a polynucleotide having the sequence of any one of SEQ ID NOS: 1-844 or a variant thereof.

In general, the term "polypeptide" as used herein refers to both the full length polypeptide encoded by the recited polynucleotide, the polypeptide encoded by the gene represented by the recited polynucleotide, as well as portions or fragments thereof.

"Polypeptides" also includes variants of the naturally occurring proteins, where such variants are homologous or substantially similar to the naturally occurring protein, and can be of an origin of the same or different species as the naturally occurring protein (*e.g.*, human, murine, or some other species that naturally expresses the recited polypeptide, usually a mammalian species). In general, variant polypeptides have a sequence that has at least about 80%, usually at least about 90%, and more usually at least about 98% sequence identity with a differentially expressed polypeptide of the invention, as measured by BLAST using the parameters described above. The variant polypeptides can be naturally or non-naturally glycosylated, *i.e.*, the polypeptide has a glycosylation pattern that differs from the glycosylation pattern found in the corresponding naturally occurring protein.

The invention also encompasses homologs of the disclosed polypeptides (or fragments thereof) where the homologs are isolated from other species, *i.e.* other animal or plant species, where such homologs, usually mammalian species, *e.g.* rodents, such as mice, rats; domestic animals, *e.g.*, horse, cow, dog, cat; and humans. By homolog is meant a polypeptide having at least about 35%, usually at least about 40% and more usually at least about 60% amino acid sequence identity a particular differentially expressed protein as identified above, where sequence identity is determined using the BLAST algorithm, with the parameters described *supra*.

In general, the polypeptides of the subject invention are provided in a non-naturally occurring environment, *e.g.* are separated from their naturally occurring environment. In certain embodiments, the subject protein is present in a composition that is enriched for the protein as compared to a control. As such, purified polypeptide is provided, where by

purified is meant that the protein is present in a composition that is substantially free of non-differentially expressed polypeptides, where by substantially free is meant that less than 90%, usually less than 60% and more usually less than 50% of the composition is made up of non-differentially expressed polypeptides.

5 Also within the scope of the invention are variants; variants of polypeptides include mutants, fragments, and fusions. Mutants can include amino acid substitutions, additions or deletions. The amino acid substitutions can be conservative amino acid substitutions or substitutions to eliminate non-essential amino acids, such as to alter a glycosylation site, a phosphorylation site or an acetylation site, or to minimize misfolding by substitution or
10 deletion of one or more cysteine residues that are not necessary for function. Conservative amino acid substitutions are those that preserve the general charge, hydrophobicity/hydrophilicity, and/or steric bulk of the amino acid substituted. For example, substitutions between the following groups are conservative: Gly/Ala, Val/Ile/Leu, Asp/Glu, Lys/Arg, Asn/Gln, Ser/Cys, Thr, and Phe/Trp/Tyr.

15 Variants can be designed so as to retain biological activity of a particular region of the protein (*e.g.*, a functional domain and/or, where the polypeptide is a member of a protein family, a region associated with a consensus sequence). In a non-limiting example, Osawa *et al.*, *Biochem. Mol. Int.* (1994) 34:1003, discusses the actin binding region of a protein from several different species. The actin binding regions of the these species are considered
20 homologous based on the fact that they have amino acids that fall within "homologous residue groups." Homologous residues are judged according to the following groups (using single letter amino acid designations): STAG; ILVMF; HRK; DEQN; and FYW. For example, and S, a T, an A or a G can be in a position and the function (in this case actin binding) is retained.

25 Additional guidance on amino acid substitution is available from studies of protein evolution. Go *et al.*, *Int. J. Peptide Protein Res.* (1980) 15:211, classified amino acid residue sites as interior or exterior depending on their accessibility. More frequent substitution on exterior sites was confirmed to be general in eight sets of homologous protein families regardless of their biological functions and the presence or absence of a prosthetic group.
30 Virtually all types of amino acid residues had higher mutabilities on the exterior than in the interior. No correlation between mutability and polarity was observed of amino acid

residues in the interior and exterior, respectively. Amino acid residues were classified into one of three groups depending on their polarity: polar (Arg, Lys, His, Gln, Asn, Asp, and Glu); weak polar (Ala, Pro, Gly, Thr, and Ser), and nonpolar (Cys, Val, Met, Ile, Leu, Phe, Tyr, and Trp). Amino acid replacements during protein evolution were very conservative: 88% and 76% of them in the interior or exterior, respectively, were within the same group of the three. Inter-group replacements are such that weak polar residues are replaced more often by nonpolar residues in the interior and more often by polar residues on the exterior.

Additional guidance for production of polypeptide variants is provided in Querol *et al.*, *Prot. Eng.* (1996) 9:265, which provides general rules for amino acid substitutions to enhance protein thermostability. New glycosylation sites can be introduced as discussed in Olsen and Thomsen, *J. Gen. Microbiol.* (1991) 137:579. An additional disulfide bridge can be introduced, as discussed by Perry and Wetzel, *Science* (1984) 226:555; Pantoliano *et al.*, *Biochemistry* (1987) 26:2077; Matsumura *et al.*, *Nature* (1989) 342:291; Nishikawa *et al.*, *Protein Eng.* (1990) 3:443; Takagi *et al.*, *J. Biol. Chem.* (1990) 265:6874; Clarke *et al.*, *Biochemistry* (1993) 32:4322; and Wakarchuk *et al.*, *Protein Eng.* (1994) 7:1379. Metal binding sites can be introduced, according to Toma *et al.*, *Biochemistry* (1991) 30:97, and Haezebrouck *et al.*, *Protein Eng.* (1993) 6:643. Substitutions with prolines in loops can be made according to Masul *et al.*, *Appl. Env. Microbiol.* (1994) 60:3579; and Hardy *et al.*, *FEBS Lett.* 317:89.

Cysteine-depleted muteins are considered variants within the scope of the invention. These variants can be constructed according to methods disclosed in U.S. Patent No. 4,959,314, which discloses substitution of cysteines with other amino acids, and methods for assaying biological activity and effect of the substitution. Such methods are suitable for proteins according to this invention that have cysteine residues suitable for such substitutions, for example to eliminate disulfide bond formation.

Variants also include fragments of the polypeptides disclosed herein, particularly biologically active fragments and/or fragments corresponding to functional domains. Fragments of interest will typically be at least about 10 aa to at least about 15 aa in length, usually at least about 50 aa in length, and can be as long as 300 aa in length or longer, but will usually not exceed about 1000 aa in length, where the fragment will have a stretch of

amino acids that is identical to a polypeptide encoded by a polynucleotide having a sequence of any SEQ ID NOS:1-844, or a homolog thereof.

The protein variants described herein are encoded by polynucleotides that are within the scope of the invention. The genetic code can be used to select the appropriate codons to
5 construct the corresponding variants.

VI. Computer-Related Embodiments

In general, a library of polynucleotides is a collection of sequence information, which information is provided in either biochemical form (*e.g.*, as a collection of polynucleotide
10 molecules), or in electronic form (*e.g.*, as a collection of polynucleotide sequences stored in a computer-readable form, as in a computer system and/or as part of a computer program). The sequence information of the polynucleotides can be used in a variety of ways, *e.g.*, as a resource for gene discovery, as a representation of sequences expressed in a selected cell type (*e.g.*, cell type markers), and/or as markers of a given disease or disease state. In
15 general, a disease marker is a representation of a gene product that is present in all affected by disease either at an increased or decreased level relative to a normal cell (*e.g.*, a cell of the same or similar type that is not substantially affected by disease). For example, a polynucleotide sequence in a library can be a polynucleotide that represents an mRNA, polypeptide, or other gene product encoded by the polynucleotide, that is either
20 overexpressed or underexpressed in a breast ductal cell affected by cancer relative to a normal (*i.e.*, substantially disease-free) breast cell.

The nucleotide sequence information of the library can be embodied in any suitable form, *e.g.*, electronic or biochemical forms. For example, a library of sequence information embodied in electronic form includes an accessible computer data file (or, in biochemical
25 form, a collection of nucleic acid molecules) that contains the representative nucleotide sequences of genes that are differentially expressed (*e.g.*, overexpressed or underexpressed) as between, for example, i) a cancerous cell and a normal cell; ii) a cancerous cell and a dysplastic cell; iii) a cancerous cell and a cell affected by a disease or condition other than cancer; iv) a metastatic cancerous cell and a normal cell and/or non-metastatic cancerous
30 cell; v) a malignant cancerous cell and a non-malignant cancerous cell (or a normal cell) and/or vi) a dysplastic cell relative to a normal cell. Other combinations and comparisons of

cells affected by various diseases or stages of disease will be readily apparent to the ordinarily skilled artisan. Biochemical embodiments of the library include a collection of nucleic acids that have the sequences of the genes in the library, where the nucleic acids can correspond to the entire gene in the library or to a fragment thereof, as described in greater
5 detail below.

The polynucleotide libraries of the subject invention include sequence information of a plurality of polynucleotide sequences, where at least one of the polynucleotides has a sequence of any of SEQ ID NOS:1-844. By plurality is meant at least 2, usually at least 3 and can include up to all of SEQ ID NOS:1-844. The length and number of polynucleotides
10 in the library will vary with the nature of the library, *e.g.*, if the library is an oligonucleotide array, a cDNA array, a computer database of the sequence information, etc.

Where the library is an electronic library, the nucleic acid sequence information can be present in a variety of media. "Media" refers to a manufacture, other than an isolated nucleic acid molecule, that contains the sequence information of the present invention. Such
15 a manufacture provides the genome sequence or a subset thereof in a form that can be examined by means not directly applicable to the sequence as it exists in a nucleic acid. For example, the nucleotide sequence of the present invention, *e.g.* the nucleic acid sequences of any of the polynucleotides of SEQ ID NOS:1-844, can be recorded on computer readable media, *e.g.* any medium that can be read and accessed directly by a computer. Such media
20 include, but are not limited to: magnetic storage media, such as a floppy disc, a hard disc storage medium, and a magnetic tape; optical storage media such as CD-ROM; electrical storage media such as RAM and ROM; and hybrids of these categories such as magnetic/optical storage media. One of skill in the art can readily appreciate how any of the presently known computer readable mediums can be used to create a manufacture
25 comprising a recording of the present sequence information. "Recorded" refers to a process for storing information on computer readable medium, using any such methods as known in the art. Any convenient data storage structure can be chosen, based on the means used to access the stored information. A variety of data processor programs and formats can be used for storage, *e.g.* word processing text file, database format, *etc.* In addition to the sequence
30 information, electronic versions of the libraries of the invention can be provided in conjunction or connection with other computer-readable information and/or other types of

computer-readable files (*e.g.*, searchable files, executable files, *etc.*, including, but not limited to, for example, search program software, *etc.*).

By providing the nucleotide sequence in computer readable form, the information can be accessed for a variety of purposes. Computer software to access sequence information is publicly available. For example, the BLAST (Altschul *et al.*, *supra.*) and BLAZE (Brutlag *et al. Comp. Chem.* (1993) 17:203) search algorithms on a Sybase system can be used to identify open reading frames (ORFs) within the genome that contain homology to ORFs from other organisms.

As used herein, "a computer-based system" refers to the hardware means, software means, and data storage means used to analyze the nucleotide sequence information of the present invention. The minimum hardware of the computer-based systems of the present invention comprises a central processing unit (CPU), input means, output means, and data storage means. A skilled artisan can readily appreciate that any one of the currently available computer-based system are suitable for use in the present invention. The data storage means can comprise any manufacture comprising a recording of the present sequence information as described above, or a memory access means that can access such a manufacture.

"Search means" refers to one or more programs implemented on the computer-based system, to compare a target sequence or target structural motif with the stored sequence information. Search means are used to identify fragments or regions of the genome that match a particular target sequence or target motif. A variety of known algorithms are publicly known and commercially available, *e.g.* MacPattern (EMBL), BLASTN and BLASTX (NCBI). A "target sequence" can be any DNA or amino acid sequence of six or more nucleotides or two or more amino acids, preferably from about 10 to 100 amino acids or from about 30 to 300 nucleotide residues.

A "target structural motif," or "target motif," refers to any rationally selected sequence or combination of sequences in which the sequence(s) are chosen based on a three-dimensional configuration that is formed upon the folding of the target motif, or on consensus sequences of regulatory or active sites. There are a variety of target motifs known in the art. Protein target motifs include, but are not limited to, enzyme active sites and signal sequences. Nucleic acid target motifs include, but are not limited to, hairpin structures,

promoter sequences and other expression elements such as binding sites for transcription factors.

A variety of structural formats for the input and output means can be used to input and output the information in the computer-based systems of the present invention. One
5 format for an output means ranks fragments of the genome possessing varying degrees of homology to a target sequence or target motif. Such presentation provides a skilled artisan with a ranking of sequences and identifies the degree of sequence similarity contained in the identified fragment.

A variety of comparing means can be used to compare a target sequence or target
10 motif with the data storage means to identify sequence fragments of the genome. A skilled artisan can readily recognize that any one of the publicly available homology search programs can be used as the search means for the computer based systems of the present invention.

As discussed above, the "library" of the invention also encompasses biochemical
15 libraries of the polynucleotides of SEQ ID NOS:1-844, *e.g.*, collections of nucleic acids representing the provided polynucleotides. The biochemical libraries can take a variety of forms, *e.g.*, a solution of cDNAs, a pattern of probe nucleic acids stably associated with a surface of a solid support (*i.e.*, an array) and the like. Of particular interest are nucleic acid arrays in which one or more of SEQ ID NOS:1-844 is represented on the array. By array is
20 meant a an article of manufacture that has at least a substrate with at least two distinct nucleic acid targets on one of its surfaces, where the number of distinct nucleic acids can be considerably higher, typically being at least 10 nt, usually at least 20 nt and often at least 25 nt. A variety of different array formats have been developed and are known to those of skill in the art, including those described in 5,242,974; 5,384,261; 5,405,783; 5,412,087;
25 5,424,186; 5,429,807; 5,436,327; 5,445,934; 5,472,672; 5,527,681; 5,529,756; 5,545,531; 5,554,501; 5,556,752; 5,561,071; 5,599,895; 5,624,711; 5,639,603; 5,658,734; WO 93/17126; WO 95/11995; WO 95/35505; EP 742287; and EP 799897. The arrays of the subject invention find use in a variety of applications, including gene expression analysis, drug screening, mutation analysis and the like, as disclosed in the above-listed exemplary
30 patent documents.

In addition to the above nucleic acid libraries, analogous libraries of polypeptides are also provided, where the where the polypeptides of the library will represent at least a portion of the polypeptides encoded by SEQ ID NOS:1-844.

5 VII. Utilities

A. Use of Polynucleotide Probes in Mapping, and in Tissue Profiling

Polynucleotide probes, generally comprising at least 12 contiguous nucleotides of a polynucleotide as shown in the Sequence Listing, are used for a variety of purposes, such as chromosome mapping of the polynucleotide and detection of transcription levels. Additional
10 disclosure about preferred regions of the disclosed polynucleotide sequences is found in the Examples. A probe that hybridizes specifically to a polynucleotide disclosed herein should provide a detection signal at least 5-, 10-, or 20-fold higher than the background hybridization provided with other unrelated sequences.

Probes in Detection of Expression Levels. Nucleotide probes are used to detect
15 expression of a gene corresponding to the provided polynucleotide. The references describe an example of a sandwich nucleotide hybridization assay. For example, in Northern blots, mRNA is separated electrophoretically and contacted with a probe. A probe is detected as hybridizing to an mRNA species of a particular size. The amount of hybridization is quantitated to determine relative amounts of expression, for example under a particular
20 condition. Probes are also used to detect products of amplification by polymerase chain reaction. The products of the reaction are hybridized to the probe and hybrids are detected. Probes are used for in situ hybridization to cells to detect expression. Probes can also be used *in vivo* for diagnostic detection of hybridizing sequences. Probes are typically labeled with a radioactive isotope. Other types of detectable labels can be used such as
25 chromophores, fluors, and enzymes. Other examples of nucleotide hybridization assays are described in WO92/02526 and U.S. Patent No. 5,124,246.

Alternatively, the Polymerase Chain Reaction (PCR) is another means for detecting small amounts of target nucleic acids (see, *e.g.*, Mullis *et al.*, *Meth. Enzymol.* (1987) 155:335; U.S. Patent No. 4,683,195; and U.S. Patent No. 4,683,202). Two primer
30 polynucleotides nucleotides hybridize with the target nucleic acids and are used to prime the reaction. The primers can be composed of sequence within or 3' and 5' to the polynucleotides of the Sequence Listing. Alternatively, if the primers are 3' and 5' to these

polynucleotides, they need not hybridize to them or the complements. A thermostable polymerase creates copies of target nucleic acids from the primers using the original target nucleic acids as a template. After a large amount of target nucleic acids is generated by the polymerase, it is detected by methods such as Southern blots. When using the Southern blot method, the labeled probe will hybridize to a polynucleotide of the Sequence Listing or complement.

Furthermore, mRNA or cDNA can be detected by traditional blotting techniques described in Sambrook *et al.*, "Molecular Cloning: A Laboratory Manual" (New York, Cold Spring Harbor Laboratory, 1989). mRNA or cDNA generated from mRNA using a polymerase enzyme can be purified and separated using gel electrophoresis. The nucleic acids on the gel are then blotted onto a solid support, such as nitrocellulose. The solid support is exposed to a labeled probe and then washed to remove any unhybridized probe. Next, the duplexes containing the labeled probe are detected. Typically, the probe is labeled with radioactivity.

Mapping. Polynucleotides of the present invention are used to identify a chromosome on which the corresponding gene resides. Such mapping can be useful in identifying the function of the polynucleotide-related gene by its proximity to other genes with known function. Function can also be assigned to the polynucleotide-related gene when particular syndromes or diseases map to the same chromosome. For example, use of polynucleotide probes in identification and quantification of nucleic acid sequence aberrations is described in U.S. Patent No. 5,783,387.

For example, fluorescence in situ hybridization (FISH) on normal metaphase spreads facilitates comparative genomic hybridization to allow total genome assessment of changes in relative copy number of DNA sequences. See Schwartz and Samad, *Curr. Opin.*

Biotechnol. (1994) 8:70; Kallioniemi *et al.*, *Sem. Cancer Biol.* (1993) 4:41; Valdes *et al.*, *Methods in Molecular Biology* (1997) 68:1, Boultonwood, ed., Human Press, Totowa, NJ.

Preparations of human metaphase chromosomes are prepared using standard cytogenetic techniques from human primary tissues or cell lines. Nucleotide probes comprising at least 12 contiguous nucleotides selected from the nucleotide sequence shown in the Sequence Listing are used to identify the corresponding chromosome. The nucleotide probes are labeled, for example, with a radioactive, fluorescent, biotinylated, or chemiluminescent label,

and detected by well known methods appropriate for the particular label selected. Protocols for hybridizing nucleotide probes to preparations of metaphase chromosomes are also well known in the art. A nucleotide probe will hybridize specifically to nucleotide sequences in the chromosome preparations that are complementary to the nucleotide sequence of the probe.

Polynucleotides are mapped to particular chromosomes using, for example, radiation hybrids or chromosome-specific hybrid panels. See Leach *et al.*, *Advances in Genetics*, (1995) 33:63-99; Walter *et al.*, *Nature Genetics* (1994) 7:22; Walter and Goodfellow, *Trends in Genetics* (1992) 9:352. Panels for radiation hybrid mapping are available from Research Genetics, Inc., Huntsville, Alabama, USA. Databases for markers using various panels are available via the world wide web at <http://F/shgc-www.stanford.edu>; and <http://www-genome.wi.mit.edu/cgi-bin/contig/rhmapper.pl>. The statistical program RHMAP can be used to construct a map based on the data from radiation hybridization with a measure of the relative likelihood of one order versus another. RHMAP is available via the world wide web at <http://www.sph.umich.edu/group/statgen/software>.

In addition, commercial programs are available for identifying regions of chromosomes commonly associated with disease, such as cancer. Polynucleotides based on the polynucleotides of the invention can be used to probe these regions. For example, if through profile searching a provided polynucleotide is identified as corresponding to a gene encoding a kinase, its ability to bind to a cancer-related chromosomal region will suggest its role as a kinase in one or more stages of tumor cell development/growth. Although some experimentation would be required to elucidate the role, the polynucleotide constitutes a new material for isolating a specific protein that has potential for developing a cancer diagnostic or therapeutic.

Tissue Typing or Profiling. Expression of specific mRNA corresponding to the provided polynucleotides can vary in different cell types and can be tissue-specific. This variation of mRNA levels in different cell types can be exploited with nucleic acid probe assays to determine tissue types. For example, PCR, branched DNA probe assays, or blotting techniques utilizing nucleic acid probes substantially identical or complementary to polynucleotides listed in the Sequence Listing can determine the presence or absence of the corresponding cDNA or mRNA.

For example, a metastatic lesion is identified by its developmental organ or tissue source by identifying the expression of a particular marker of that organ or tissue. If a polynucleotide is expressed only in a specific tissue type, and a metastatic lesion is found to express that polynucleotide, then the developmental source of the lesion has been identified.

- 5 Expression of a particular polynucleotide is assayed by detection of either the corresponding mRNA or the protein product. Immunological methods, such as antibody staining, are used to detect a particular protein product. Hybridization methods can be used to detect particular mRNA species, including but not limited to in situ hybridization and Northern blotting.

- Use of Polymorphisms. A polynucleotide of the invention will be useful in forensics,
10 genetic analysis, mapping, and diagnostic applications if the corresponding region of a gene is polymorphic in the human population. Particular polymorphic forms of the provided polynucleotides can be used to either identify a sample as deriving from a suspect or rule out the possibility that the sample derives from the suspect. Any means for detecting a polymorphism in a gene are used, including but not limited to electrophoresis of protein
15 polymorphic variants, differential sensitivity to restriction enzyme cleavage, and hybridization to allele-specific probes.

B. Antibody Production

- Expression products of a polynucleotide of the invention, the corresponding mRNA or cDNA, or the corresponding complete gene are prepared and used for raising antibodies
20 for experimental, diagnostic, and therapeutic purposes. For polynucleotides to which a corresponding gene has not been assigned, this provides an additional method of identifying the corresponding gene. The polynucleotide or related cDNA is expressed as described above, and antibodies are prepared. These antibodies are specific to an epitope on the polypeptide encoded by the polynucleotide, and can precipitate or bind to the corresponding
25 native protein in a cell or tissue preparation or in a cell-free extract of an in vitro expression system.

- Immunogens for raising antibodies are prepared by mixing the polypeptides encoded by the polynucleotides of the present invention with adjuvants. Alternatively, polypeptides are made as fusion proteins to larger immunogenic proteins. Polypeptides are also
30 covalently linked to other larger immunogenic proteins, such as keyhole limpet hemocyanin. Immunogens are typically administered intradermally, subcutaneously, or intramuscularly.

Immunogens are administered to experimental animals such as rabbits, sheep, and mice, to generate antibodies. Optionally, the animal spleen cells are isolated and fused with myeloma cells to form hybridomas which secrete monoclonal antibodies. Such methods are well known in the art. According to another method known in the art, the selected polynucleotide
5 is administered directly, such as by intramuscular injection, and expressed in vivo. The expressed protein generates a variety of protein-specific immune responses, including production of antibodies, comparable to administration of the protein.

Preparations of polyclonal and monoclonal antibodies specific for polypeptides encoded by a selected polynucleotide are made using standard methods known in the art.
10 The antibodies specifically bind to epitopes present in the polypeptides encoded by polynucleotides disclosed in the Sequence Listing. Typically, at least 6, 8, 10, or 12 contiguous amino acids are required to form an epitope. However, epitopes which involve non-contiguous amino acids may require more, for example at least 15, 25, or 50 amino acids. A short sequence of a polynucleotide may then be unsuitable for use as an epitope to
15 raise antibodies for identifying the corresponding novel protein, because of the potential for cross-reactivity with a known protein. However, the antibodies can be useful for other purposes, particularly if they identify common structural features of a known protein and a novel polypeptide encoded by a polynucleotide of the invention.

Antibodies that specifically bind to human polypeptides encoded by the provided
20 polypeptides should provide a detection signal at least 5-, 10-, or 20-fold higher than a detection signal provided with other proteins when used in Western blots or other immunochemical assays. Preferably, antibodies that specifically polypeptides of the invention do not bind to other proteins in immunochemical assays at detectable levels and can immunoprecipitate the specific polypeptide from solution.

25 To test for the presence of serum antibodies to the polypeptide of the invention in a human population, human antibodies are purified by methods well known in the art. Preferably, the antibodies are affinity purified by passing antiserum over a column to which the corresponding selected polypeptide or fusion protein is bound. The bound antibodies can then be eluted from the column, for example using a buffer with a high salt concentration.

In addition to the antibodies discussed above, genetically engineered antibody derivatives are made, such as single chain antibodies, according to methods well known in the art.

C. Use of Polynucleotides to Construct Arrays for Diagnostics

5 Polynucleotide arrays provide a high throughput technique that can assay a large number of polynucleotide sequences in a sample. This technology can be used as a diagnostic and as a tool to test for differential expression to determine function of an encoded protein. Arrays can be created by spotting polynucleotide probes onto a substrate (*e.g.*, glass, nitrocellulose, *etc.*) in a two-dimensional matrix or array having bound probes.

10 The probes can be bound to the substrate by either covalent bonds or by non-specific interactions, such as hydrophobic interactions. Samples of polynucleotides can be detectably labeled (*e.g.*, using radioactive or fluorescent labels) and then hybridized to the probes. Double stranded polynucleotides, comprising the labeled sample polynucleotides bound to probe polynucleotides, can be detected once the unbound portion of the sample is washed

15 away. Techniques for constructing arrays and methods of using these arrays are described in EP No. 0 799 897; PCT No. WO 97/29212; PCT No. WO 97/27317; EP No. 0 785 280; PCT No. WO 97/02357; U.S. Pat. No. 5,593,839; U.S. Pat. No. 5,578,832; EP No. 0 728 520; U.S. Pat. No. 5,599,695; EP No. 0 721 016; U.S. Pat. No. 5,556,752; PCT No. WO 95/22058; and U.S. Pat. No. 5,631,734.

20 As discussed in some detail above, arrays can be used to examine differential expression of genes and can be used to determine gene function. For example, arrays of the instant polynucleotide sequences can be used to determine if any of the provided polynucleotides are differentially expressed between a test cell and control cell (*e.g.*, cancer cells and normal cells). For example, high expression of a particular message in a cancer

25 cell, which is not observed in a corresponding normal cell, can indicate a cancer specific protein. Exemplary uses of arrays are further described in, for example, Pappalarado *et al.*, *Sem. Radiation Oncol.* (1998) 8:217; and Ramsay *Nature Biotechnol.* (1998) 16:40.

D. Differential Expression

The polynucleotides of the invention can also be used to detect differences in

30 expression levels between two cells, *e.g.*, as a method to identify abnormal or diseased tissue in a human. For polynucleotides corresponding to profiles of protein families as described

above, the choice of tissue can be selected according to the putative biological function. In general, the expression of a gene corresponding to a specific polynucleotide is compared between a first tissue that is suspected of being diseased and a second, normal tissue of the human. The tissue suspected of being abnormal or diseased can be derived from a different
5 tissue type of the human, but preferably it is derived from the same tissue type; for example an intestinal polyp or other abnormal growth should be compared with normal intestinal tissue. The normal tissue can be the same tissue as that of the test sample, or any normal tissue of the patient, especially those that express the polynucleotide-related gene of interest (*e.g.*, brain, thymus, testis, heart, prostate, placenta, spleen, small intestine, skeletal muscle,
10 pancreas, and the mucosal lining of the colon). A difference between the polynucleotide-related gene, mRNA, or protein in the two tissues which are compared, for example in molecular weight, amino acid or nucleotide sequence, or relative abundance, indicates a change in the gene, or a gene which regulates it, in the tissue of the human that was suspected of being diseased. Examples of detection of differential expression and its use in
15 diagnosis of cancer are described in U.S. Patent Nos. 5,688,641 and 5,677,125.

The polynucleotide-related genes in the two tissues are compared by any means known in the art. For example, the two genes can be sequenced, and the sequence of the gene in the tissue suspected of being diseased compared with the gene sequence in the normal tissue. The genes corresponding to a provided polynucleotide, or portions thereof, in
20 the two tissues are amplified, for example using nucleotide primers based on the nucleotide sequence shown in the Sequence Listing, using the polymerase chain reaction. The amplified genes or portions of genes are hybridized to detectably labeled nucleotide probes selected from a nucleotide sequence shown in the Sequence Listing. A difference in the nucleotide sequence of the isolated gene in the tissue suspected of being diseased compared
25 with the normal nucleotide sequence suggests a role of the gene product encoded by the subject polynucleotide in the disease, and provides guidance for preparing a therapeutic agent.

Alternatively, mRNA corresponding to a provided polynucleotide in the two tissues is compared. PolyA⁺ RNA is isolated from the two tissues as is known in the art. For
30 example, one of skill in the art can readily determine differences in the size or amount of mRNA transcripts between the two tissues using Northern blots and detectably labeled

nucleotide probes selected from the nucleotide sequence shown in the Sequence Listing.

Increased or decreased expression of a given mRNA in a tissue sample suspected of being diseased, compared with the expression of the same mRNA in a normal tissue, suggests that the expressed protein has a role in the disease, and also provides a lead for preparing a

5 therapeutic agent.

The comparison can also be accomplished by analyzing polypeptides between the matched samples. The sizes of the proteins in the two tissues are compared, for example, using antibodies of the present invention to detect polypeptides in Western blots of protein extracts from the two tissues. Other changes, such as expression levels and subcellular
10 localization, can also be detected immunologically, using antibodies to the corresponding protein. A higher or lower level of expression of a given polypeptide in a tissue suspected of being diseased, compared with the same protein expression level in a normal tissue, is indicative that the expressed protein has a role in the disease, and provides guidance for preparing a therapeutic agent.

15 Similarly, comparison of polynucleotide sequences or of gene expression products, *e.g.*, mRNA and protein, between a human tissue that is suspected of being diseased and a normal tissue of a human, are used to follow disease progression or remission in the human. Such comparisons are made as described above. For example, increased or decreased expression of a gene corresponding to an inventive polynucleotide in the tissue suspected of
20 being neoplastic can indicate the presence of neoplastic cells in the tissue. The degree of increased expression of a given gene in the neoplastic tissue relative to expression of the same gene in normal tissue, or differences in the amount of increased expression of a given gene in the neoplastic tissue over time, is used to assess the progression of the neoplasia in that tissue or to monitor the response of the neoplastic tissue to a therapeutic protocol over
25 time.

The expression pattern of any two cell types can be compared, such as low and high metastatic tumor cell lines, malignant or non-malignant cells, or cells from tissue which have and have not been exposed to a therapeutic agent. A genetic predisposition to disease in a human is detected by comparing expression levels of an mRNA or protein corresponding to
30 a polynucleotide of the invention in a fetal tissue with levels associated in normal fetal tissue. Fetal tissues that are used for this purpose include, but are not limited to, amniotic

fluid, chorionic villi, blood, and the blastomere of an in vitro-fertilized embryo. The comparable normal polynucleotide-related gene is obtained from any tissue. The mRNA or protein is obtained from a normal tissue of a human in which the polynucleotide-related gene is expressed. Differences such as alterations in the nucleotide sequence or size of the same product of the fetal polynucleotide-related gene or mRNA, or alterations in the molecular weight, amino acid sequence, or relative abundance of fetal protein, can indicate a germline mutation in the polynucleotide-related gene of the fetus, which indicates a genetic predisposition to disease. Particular diagnostic and prognostic uses of the disclosed polynucleotides are described in more detail below.

10 E. Diagnostic, Prognostic, and Other Uses Based On Differential Expression

In general, diagnostic methods of the invention for involve detection of a level or amount of a gene product, particularly a differentially expressed gene product, in a test sample obtained from a patient suspected of having or being susceptible to a disease (*e.g.*, breast cancer, lung cancer, colon cancer and/or metastatic forms thereof), and comparing the detected levels to those levels found in normal cells (*e.g.*, cells substantially unaffected by cancer) and/or other control cells (*e.g.*, to differentiate a cancerous cell from a cell affected by dysplasia). Furthermore, the severity of the disease can be assessed by comparing the detected levels of a differentially expressed gene product with those levels detected in samples representing the levels of differentially gene product associated with varying degrees of severity of disease.

The term “differentially expressed gene” is intended to encompass a polynucleotide that can, for example, include an open reading frame encoding a gene product (*e.g.*, a polypeptide), and/or introns of such genes and adjacent 5' and 3' non-coding nucleotide sequences involved in the regulation of expression, up to about 20 kb beyond the coding region, but possibly further in either direction. The gene can be introduced into an appropriate vector for extrachromosomal maintenance or for integration into a host genome. In general, a difference in expression level associated with a decrease in expression level of at least about 25%, usually at least about 50% to 75%, more usually at least about 90% or more is indicative of a differentially expressed gene of interest, *i.e.*, a gene that is underexpressed or down-regulated in the test sample relative to a control sample. Furthermore, a difference in expression level associated with an increase in expression of at

least about 25%, usually at least about 50% to 75%, more usually at least about 90% and can be at least about 1 ½-fold, usually at least about 2-fold to about 10-fold, and can be about 100-fold to about 1,000-fold increase relative to a control sample is indicative of a differentially expressed gene of interest, *i.e.*, an overexpressed or up-regulated gene.

5 "Differentially expressed polynucleotide" as used herein means a nucleic acid molecule (RNA or DNA) having a sequence that represents a differentially expressed gene, *e.g.*, the differentially expressed polynucleotide comprises a sequence (*e.g.*, an open reading frame encoding a gene product) that uniquely identifies a differentially expressed gene so that detection of the differentially expressed polynucleotide in a sample is correlated with the
10 presence of a differentially expressed gene in a sample. "Differentially expressed polynucleotides" is also meant to encompass fragments of the disclosed polynucleotides, *e.g.*, fragments retaining biological activity, as well as nucleic acids homologous, substantially similar, or substantially identical (*e.g.*, having about 90% sequence identity) to the disclosed polynucleotides.

15 Methods of the subject invention useful in diagnosis or prognosis typically involve comparison of the abundance of a selected differentially expressed gene product in a sample of interest with that of a control to determine any relative differences in the expression of the gene product, where the difference can be measured qualitatively and/or quantitatively. Quantitation can be accomplished, for example, by comparing the level of expression
20 product detected in the sample with the amounts of product present in a standard curve. A comparison can be made visually; by using a technique such as densitometry, with or without computerized assistance; by preparing a representative library of cDNA clones of mRNA isolated from a test sample, sequencing the clones in the library to determine that number of cDNA clones corresponding to the same gene product, and analyzing the number
25 of clones corresponding to that same gene product relative to the number of clones of the same gene product in a control sample; or by using an array to detect relative levels of hybridization to a selected sequence or set of sequences, and comparing the hybridization pattern to that of a control. The differences in expression are then correlated with the presence or absence of an abnormal expression pattern. A variety of different methods for
30 determining the nucleic acid abundance in a sample are known to those of skill in the art, where particular methods of interest include those described in: Pietu *et al.* *Genome Res.*

(1996) 6:492; Zhao *et al.*, *Gene* (1995) 156:207; Soares, *Curr. Opin. Biotechnol.* (1977) 8: 542; Raval, *J. Pharmacol Toxicol Methods* (1994) 32:125; Chalifour *et al.*, *Anal. Biochem* (1994) 216:299; Stolz *et al.*, *Mol. Biotechnol.* (1996) 6:225; Hong *et al.*, *Biosci. Reports* (1982) 2:907; and McGraw, *Anal. Biochem.* (1984) 143:298. Also of interest are the
5 methods disclosed in WO 97/27317, the disclosure of which is herein incorporated by reference.

In general, diagnostic assays of the invention involve detection of a gene product of a the polynucleotide sequence (*e.g.*, mRNA or polypeptide) that corresponds to a sequence of SEQ ID NOS:1-844. The patient from whom the sample is obtained can be apparently
10 healthy, susceptible to disease (*e.g.*, as determined by family history or exposure to certain environmental factors), or can already be identified as having a condition in which altered expression of a gene product of the invention is implicated.

In the assays of the invention, the diagnosis can be determined based on detected gene product expression levels of a gene product encoded by at least one, preferably at least
15 two or more, at least 3 or more, or at least 4 or more of the polynucleotides having a sequence set forth in SEQ ID NOS:1-844, and can involve detection of expression of genes corresponding to all of SEQ ID NOS:1-844 and/or additional sequences that can serve as additional diagnostic markers and/or reference sequences. Where the diagnostic method is designed to detect the presence or susceptibility of a patient to cancer, the assay preferably
20 involves detection of a gene product encoded by a gene corresponding to a polynucleotide that is differentially expressed in cancer. For example, a higher level of expression of a polynucleotide corresponding to SEQ ID NO:52 relative to a level associated with a normal sample can indicate the presence of cancer in the patient from whom the sample is derived. In another example, detection of a lower level of a polynucleotide corresponding to SEQ ID
25 NO:39 relative to a normal level is indicative of the presence of cancer in the patient. Further examples of such differentially expressed polynucleotides are described in the Examples below. Given the provided polynucleotides and information regarding their relative expression levels provided herein, assays using such polynucleotides and detection of their expression levels in diagnosis and prognosis will be readily apparent to the ordinarily
30 skilled artisan.

Any of a variety of detectable labels can be used in connection with the various embodiments of the diagnostic methods of the invention. Suitable detectable labels include fluorochromes, (e.g. fluorescein isothiocyanate (FITC), rhodamine, Texas Red, phycoerythrin, allophycocyanin, 6-carboxyfluorescein (6-FAM), 2',7'-dimethoxy-4',5'-dichloro-6-carboxyfluorescein (JOE), 6-carboxy-X-rhodamine (ROX), 6-carboxy-2',4',7',4,7-hexachlorofluorescein (HEX), 5-carboxyfluorescein (5-FAM) or N,N,N',N'-tetramethyl-6-carboxyrhodamine (TAMRA)), radioactive labels, (e.g. ^{32}P , ^{35}S , ^3H , etc.), and the like. The detectable label can involve a two stage systems (e.g., biotin-avidin, hapten-anti-hapten antibody, etc.)

Reagents specific for the polynucleotides and polypeptides of the invention, such as antibodies and nucleotide probes, can be supplied in a kit for detecting the presence of an expression product in a biological sample. The kit can also contain buffers or labeling components, as well as instructions for using the reagents to detect and quantify expression products in the biological sample. Exemplary embodiments of the diagnostic methods of the invention are described below in more detail.

Polypeptide detection in diagnosis. In one embodiment, the test sample is assayed for the level of a differentially expressed polypeptide. Diagnosis can be accomplished using any of a number of methods to determine the absence or presence or altered amounts of the differentially expressed polypeptide in the test sample. For example, detection can utilize staining of cells or histological sections with labeled antibodies, performed in accordance with conventional methods. Cells can be permeabilized to stain cytoplasmic molecules. In general, antibodies that specifically bind a differentially expressed polypeptide of the invention are added to a sample, and incubated for a period of time sufficient to allow binding to the epitope, usually at least about 10 minutes. The antibody can be detectably labeled for direct detection (e.g., using radioisotopes, enzymes, fluorescers, chemilumescers, and the like), or can be used in conjunction with a second stage antibody or reagent to detect binding (e.g., biotin with horseradish peroxidase-conjugated avidin, a secondary antibody conjugated to a fluorescent compound, e.g. fluorescein, rhodamine, Texas red, etc.). The absence or presence of antibody binding can be determined by various methods, including flow cytometry of dissociated cells, microscopy, radiography, scintillation counting, etc. Any suitable alternative methods can of qualitative or quantitative

detection of levels or amounts of differentially expressed polypeptide can be used, for example ELISA, western blot, immunoprecipitation, radioimmunoassay, etc.

In general, the detected level of differentially expressed polypeptide in the test sample is compared to a level of the differentially expressed gene product in a reference or control sample, *e.g.*, in a normal cell (negative control) or in a cell having a known disease state (positive control). For example, a higher level of expression of a polypeptide encoded by SEQ ID NO:52 relative to a level associated with a normal sample can indicate the presence of cancer in the patient from whom the sample is derived. In another example, detection of a lower level of the polypeptide encoded by SEQ ID NO:39 relative to a normal level is indicative of the presence of cancer in the patient.

mRNA detection. The diagnostic methods of the invention can also or alternatively involve detection of mRNA encoded by a gene corresponding to a differentially expressed polynucleotides of the invention. Any suitable qualitative or quantitative methods known in the art for detecting specific mRNAs can be used. mRNA can be detected by, for example, *in situ* hybridization in tissue sections, by reverse transcriptase-PCR, or in Northern blots containing poly A⁺ mRNA. One of skill in the art can readily use these methods to determine differences in the size or amount of mRNA transcripts between two samples. For example, the level of mRNA of the invention in a tissue sample suspected of being cancerous or dysplastic is compared with the expression of the mRNA in a reference sample, *e.g.*, a positive or negative control sample (*e.g.*, normal tissue, cancerous tissue, *etc.*). In a specific non-limiting example, a higher level of mRNA corresponding to SEQ ID NO:52 relative to a level associated with a normal sample can indicate the presence of cancer in the patient from whom the sample is derived. In another example, detection of a lower level of mRNA corresponding to SEQ ID NO:39 relative to a normal level is indicative of the presence of cancer in the patient.

Any suitable method for detecting and comparing mRNA expression levels in a sample can be used in connection with the diagnostic methods of the invention (see, *e.g.*, U.S. 5,804,382). For example, mRNA expression levels in a sample can be determined by generation of a library of expressed sequence tags (ESTs) from the sample, where the EST library is representative of sequences present in the sample (Adams, et al., (1991) *Science* 252:1651). Enumeration of the relative representation of ESTs within the library can be used

to approximate the relative representation of the gene transcript within the starting sample. The results of EST analysis of a test sample can then be compared to EST analysis of a reference sample to determine the relative expression levels of a selected polynucleotide, particularly a polynucleotide corresponding to one or more of the differentially expressed
5 genes described herein.

Alternatively, gene expression in a test sample can be performed using serial analysis of gene expression (SAGE) methodology (Velculescu et al., *Science* (1995) 270:484). In short, SAGE involves the isolation of short unique sequence tags from a specific location within each transcript (*e.g.*, a sequence of any one of SEQ ID NOS:1-6). The sequence tags
10 are concatenated, cloned, and sequenced. The frequency of particular transcripts within the starting sample is reflected by the number of times the associated sequence tag is encountered with the sequence population.

Gene expression in a test sample can also be analyzed using differential display (DD) methodology. In DD, fragments defined by specific sequence delimiters (*e.g.*, restriction
15 enzyme sites) are used as unique identifiers of genes, coupled with information about fragment length or fragment location within the expressed gene. The relative representation of an expressed gene with a sample can then be estimated based on the relative representation of the fragment associated with that gene within the pool of all possible fragments. Methods and compositions for carrying out DD are well known in the art, see,
20 *e.g.*, U.S. 5,776,683; and U.S. 5,807,680.

Alternatively, gene expression in a sample using hybridization analysis, which is based on the specificity of nucleotide interactions. Oligonucleotides or cDNA can be used to selectively identify or capture DNA or RNA of specific sequence composition, and the amount of RNA or cDNA hybridized to a known capture sequence determined qualitatively
25 or quantitatively, to provide information about the relative representation of a particular message within the pool of cellular messages in a sample. Hybridization analysis can be designed to allow for concurrent screening of the relative expression of hundreds to thousands of genes by using, for example, array-based technologies having high density formats, including filters, microscope slides, or microchips, or solution-based technologies
30 that use spectroscopic analysis (*e.g.*, mass spectrometry). One exemplary use of arrays in the diagnostic methods of the invention is described below in more detail.

Use of a single gene in diagnostic applications. The diagnostic methods of the invention can focus on the expression of a single differentially expressed gene. For example, the diagnostic method can involve detecting a differentially expressed gene, or a polymorphism of such a gene (*e.g.*, a polymorphism in an coding region or control region), that is associated with disease. Disease-associated polymorphisms can include deletion or truncation of the gene, mutations that alter expression level and/or affect activity of the encoded protein, *etc.*

Changes in the promoter or enhancer sequence that affect expression levels of an differentially gene can be compared to expression levels of the normal allele by various methods known in the art. Methods for determining promoter or enhancer strength include quantitation of the expressed natural protein; insertion of the variant control element into a vector with a reporter gene such as β -galactosidase, luciferase, chloramphenicol acetyltransferase, *etc.* that provides for convenient quantitation; and the like.

A number of methods are available for analyzing nucleic acids for the presence of a specific sequence, *e.g.* a disease associated polymorphism. Where large amounts of DNA are available, genomic DNA is used directly. Alternatively, the region of interest is cloned into a suitable vector and grown in sufficient quantity for analysis. Cells that express a differentially expressed gene can be used as a source of mRNA, which can be assayed directly or reverse transcribed into cDNA for analysis. The nucleic acid can be amplified by conventional techniques, such as the polymerase chain reaction (PCR), to provide sufficient amounts for analysis, and a detectable label can be included in the amplification reaction (*e.g.*, using a detectably labeled primer or detectably labeled oligonucleotides) to facilitate detection. The use of the polymerase chain reaction is described in Saiki, *et al.*, *Science* (1985) 239:487, and a review of techniques can be found in Sambrook, *et al.*, *Molecular Cloning: A Laboratory Manual*, (1989) pp. 14.2. Alternatively, various methods are known in the art that utilize oligonucleotide ligation as a means of detecting polymorphisms, for examples see Riley *et al.*, *Nucl. Acids Res.* (1990) 18:2887; and Delahunty *et al.*, *Am. J. Hum. Genet.* (1996) 58:1239.

The sample nucleic acid, *e.g.* amplified or cloned fragment, is analyzed by one of a number of methods known in the art. The nucleic acid can be sequenced by dideoxy or other methods, and the sequence of bases compared to a selected sequence, *e.g.*, to a wild-type

sequence. Hybridization with the polymorphic or variant sequence can also be used to determine its presence in a sample (*e.g.*, by Southern blot, dot blot, *etc.*). The hybridization pattern of a polymorphic or variant sequence and a control sequence to an array of oligonucleotide probes immobilized on a solid support, as described in US 5,445,934, or in
5 WO 95/35505, can also be used as a means of identifying polymorphic or variant sequences associated with disease. Single strand conformational polymorphism (SSCP) analysis, denaturing gradient gel electrophoresis (DGGE), and heteroduplex analysis in gel matrices are used to detect conformational changes created by DNA sequence variation as alterations in electrophoretic mobility. Alternatively, where a polymorphism creates or destroys a
10 recognition site for a restriction endonuclease, the sample is digested with that endonuclease, and the products size fractionated to determine whether the fragment was digested. Fractionation is performed by gel or capillary electrophoresis, particularly acrylamide or agarose gels.

Screening for mutations in an differentially expressed gene can be based on the
15 functional or antigenic characteristics of the protein. Protein truncation assays are useful in detecting deletions that can affect the biological activity of the protein. Various immunoassays designed to detect polymorphisms in proteins can be used in screening. Where many diverse genetic mutations lead to a particular disease phenotype, functional protein assays have proven to be effective screening tools. The activity of the encoded
20 protein can be determined by comparison with the wild-type protein.

Pattern matching in diagnosis using arrays. In another embodiment, the diagnostic and/or prognostic methods of the invention involve detection of expression of a selected set of genes in a test sample to produce a test expression pattern (TEP). The TEP is compared to a reference expression pattern (REP), which is generated by detection of expression of the
25 selected set of genes in a reference sample (*e.g.*, a positive or negative control sample). The selected set of genes includes at least one of the genes of the invention, which genes correspond to the polynucleotide sequences of SEQ ID NOS:1-844. Of particular interest is a selected set of genes that includes gene differentially expressed in the disease for which the test sample is to be screened.

30 "Reference sequences" or "reference polynucleotides" as used herein in the context of differential gene expression analysis and diagnosis/prognosis refers to a selected set of

polynucleotides, which selected set includes at least one or more of the differentially expressed polynucleotides described herein. A plurality of reference sequences, preferably comprising positive and negative control sequences, can be included as reference sequences.

Additional suitable reference sequences are found in Genbank, Unigene, and other
5 nucleotide sequence databases (including, *e.g.*, expressed sequence tag (EST), partial, and full-length sequences).

"Reference array" means an array having reference sequences for use in hybridization with a sample, where the reference sequences include all, at least one of, or any subset of the differentially expressed polynucleotides described herein. Usually such an array will include
10 at least 3 different reference sequences, and can include any one or all of the provided differentially expressed sequences. Arrays of interest can further comprise sequences, including polymorphisms, of other genetic sequences, particularly other sequences of interest for screening for a disease or disorder (*e.g.*, cancer, dysplasia, or other related or unrelated diseases, disorders, or conditions). The oligonucleotide sequence on the array will usually
15 be at least about 12 nt in length, and can be of about the length of the provided sequences, or can extend into the flanking regions to generate fragments of 100 nt to 200 nt in length or more.

A "reference expression pattern" or "REP" as used herein refers to the relative levels of expression of a selected set of genes, particularly of differentially expressed genes, that is
20 associated with a selected cell type, *e.g.*, a normal cell, a cancerous cell, a cell exposed to an environmental stimulus, and the like. A "test expression pattern" or "TEP" refers to relative levels of expression of a selected set of genes, particularly of differentially expressed genes, in a test sample (*e.g.*, a cell of unknown or suspected disease state, from which mRNA is isolated).

"Diagnosis" as used herein generally includes determination of a subject's
25 susceptibility to a disease or disorder, determination as to whether a subject is presently affected by a disease or disorder, as well as to the prognosis of a subject affected by a disease or disorder (*e.g.*, identification of pre-metastatic or metastatic cancerous states, stages of cancer, or responsiveness of cancer to therapy). The present invention particularly
30 encompasses diagnosis of subjects in the context of breast cancer (*e.g.*, carcinoma in situ (*e.g.*, ductal carcinoma in situ), estrogen receptor (ER)-positive breast cancer, ER-negative

breast cancer, or other forms and/or stages of breast cancer), lung cancer (*e.g.*, small cell carcinoma, non-small cell carcinoma, mesothelioma, and other forms and/or stages of lung cancer), and colon cancer (*e.g.*, adenomatous polyp, colorectal carcinoma, and other forms and/or stages of colon cancer).

5 "Sample" or "biological sample" as used throughout here are generally meant to refer to samples of biological fluids or tissues, particularly samples obtained from tissues, especially from cells of the type associated with the disease for which the diagnostic application is designed (*e.g.*, ductal adenocarcinoma), and the like. "Samples" is also meant to encompass derivatives and fractions of such samples (*e.g.*, cell lysates). Where the sample
10 is solid tissue, the cells of the tissue can be dissociated or tissue sections can be analyzed.

 REPs can be generated in a variety of ways according to methods well known in the art. For example, REPs can be generated by hybridizing a control sample to an array having a selected set of polynucleotides (particularly a selected set of differentially expressed polynucleotides), acquiring the hybridization data from the array, and storing the data in a
15 format that allows for ready comparison of the REP with a TEP. Alternatively, all expressed sequences in a control sample can be isolated and sequenced, *e.g.*, by isolating mRNA from a control sample, converting the mRNA into cDNA, and sequencing the cDNA. The resulting sequence information roughly or precisely reflects the identity and relative number of expressed sequences in the sample. The sequence information can then be stored in a
20 format (*e.g.*, a computer-readable format) that allows for ready comparison of the REP with a TEP. The REP can be normalized prior to or after data storage, and/or can be processed to selectively remove sequences of expressed genes that are of less interest or that might complicate analysis (*e.g.*, some or all of the sequences associated with housekeeping genes can be eliminated from REP data).

25 TEPs can be generated in a manner similar to REPs, *e.g.*, by hybridizing a test sample to an array having a selected set of polynucleotides, particularly a selected set of differentially expressed polynucleotides, acquiring the hybridization data from the array, and storing the data in a format that allows for ready comparison of the TEP with a REP. The REP and TEP to be used in a comparison can be generated simultaneously, or the TEP can
30 be compared to previously generated and stored REPs.

In one embodiment of the invention, comparison of a TEP with a REP involves hybridizing a test sample with a reference array, where the reference array has one or more reference sequences for use in hybridization with a sample. The reference sequences include all, at least one of, or any subset of the differentially expressed polynucleotides described
5 herein. Hybridization data for the test sample is acquired, the data normalized, and the produced TEP compared with a REP generated using an array having the same or similar selected set of differentially expressed polynucleotides. Probes that correspond to sequences differentially expressed between the two samples will show decreased or increased hybridization efficiency for one of the samples relative to the other.

10 Reference arrays can be produced according to any suitable methods known in the art. For example, methods of producing large arrays of oligonucleotides are described in U.S. 5,134,854, and U.S. 5,445,934 using light-directed synthesis techniques. Using a computer controlled system, a heterogeneous array of monomers is converted, through simultaneous coupling at a number of reaction sites, into a heterogeneous array of polymers.

15 Alternatively, microarrays are generated by deposition of pre-synthesized oligonucleotides onto a solid substrate, for example as described in PCT published application no. WO 95/35505.

Methods for collection of data from hybridization of samples with a reference arrays are also well known in the art. For example, the polynucleotides of the reference and test
20 samples can be generated using a detectable fluorescent label, and hybridization of the polynucleotides in the samples detected by scanning the microarrays for the presence of the detectable label. Methods and devices for detecting fluorescently marked targets on devices are known in the art. Generally, such detection devices include a microscope and light source for directing light at a substrate. A photon counter detects fluorescence from the
25 substrate, while an x-y translation stage varies the location of the substrate. A confocal detection device that can be used in the subject methods is described in U.S. Patent no. 5,631,734. A scanning laser microscope is described in Shalon et al., *Genome Res.* (1996) 6:639. A scan, using the appropriate excitation line, is performed for each fluorophore used. The digital images generated from the scan are then combined for subsequent analysis. For
30 any particular array element, the ratio of the fluorescent signal from one sample (*e.g.*, a test

sample) is compared to the fluorescent signal from another sample (*e.g.*, a reference sample), and the relative signal intensity determined.

Methods for analyzing the data collected from hybridization to arrays are well known in the art. For example, where detection of hybridization involves a fluorescent label, data analysis can include the steps of determining fluorescent intensity as a function of substrate position from the data collected, removing outliers, *i.e.* data deviating from a predetermined statistical distribution, and calculating the relative binding affinity of the targets from the remaining data. The resulting data can be displayed as an image with the intensity in each region varying according to the binding affinity between targets and probes.

In general, the test sample is classified as having a gene expression profile corresponding to that associated with a disease or non-disease state by comparing the TEP generated from the test sample to one or more REPs generated from reference samples (*e.g.*, from samples associated with cancer or specific stages of cancer, dysplasia, samples affected by a disease other than cancer, normal samples, *etc.*). The criteria for a match or a substantial match between a TEP and a REP include expression of the same or substantially the same set of reference genes, as well as expression of these reference genes at substantially the same levels (*e.g.*, no significant difference between the samples for a signal associated with a selected reference sequence after normalization of the samples, or at least no greater than about 25% to about 40% difference in signal strength for a given reference sequence. In general, a pattern match between a TEP and a REP includes a match in expression, preferably a match in qualitative or quantitative expression level, of at least one of, all or any subset of the differentially expressed genes of the invention.

Pattern matching can be performed manually, or can be performed using a computer program. Methods for preparation of substrate matrices (*e.g.*, arrays), design of oligonucleotides for use with such matrices, labeling of probes, hybridization conditions, scanning of hybridized matrices, and analysis of patterns generated, including comparison analysis, are described in, for example, U.S. 5,800,992.

F. Use of the Polynucleotides of the Invention in Cancer

Oncogenesis involves the unbridled growth, dedifferentiation and abnormal migration of cells. Cancerous cells can have the ability to compress, invade, and destroy normal tissue. Cancerous cells may also metastasize to other parts of the body via the

bloodstream or the lymph system and colonize in these other areas. Different cancers are classified by the cell from which the cancerous cell is derived and from its cellular morphology and/or state of differentiation.

Somatic genetic abnormalities cause cancer initiation and progression. Cancer
5 generally is clonally formed, *i.e.* gain of function of oncogenes and loss of function of tumor suppressor genes within a single cell transform the cell to be cancerous, and that single cell grows and divides to form a cancerous lesion. The genes known to be involved in cancer initiation and progression are involved in numerous cellular functions, including developmental differentiation, cell cycle regulation, cell signaling, immunological response,
10 DNA replication, and DNA repair.

The identification and characterization of genetic or biochemical markers in blood or tissues that will detect the earliest changes along the carcinogenesis pathway and monitor the efficacy of various therapies and preventive interventions is a major goal of cancer research. Scientists have identified genetic changes in stool specimens that indicate the stages of colon
15 cancer, and other biomarkers such as gene mutations, hormone receptors, proteins that inhibit metastasis, and enzymes that metabolize drugs are all being used to determine the severity and predict the course of breast, prostate, lung, and other cancers.

Recent advances in the pathogenesis of certain cancers has been helpful in determining patient treatment. The level of expression of certain polynucleotides can be
20 indicative of a poorer prognosis, and therefore warrant more aggressive chemo- or radio-therapy for a patient. The correlation of novel surrogate tumor specific features with response to treatment and outcome in patients has defined certain prognostic indicators that allow the design of tailored therapy based on the molecular profile of the tumor. These therapies include antibody targeting and gene therapy. Moreover, a promising level of one
25 or more marker polynucleotides can provide impetus for not aggressively treating a particular patient, thus sparing the patient the deleterious side effects of aggressive therapy. Determining expression of certain polynucleotides and comparison of a patients profile with known expression in normal tissue and variants of the disease allows a determination of the best possible treatment for a patient, both in terms of specificity of treatment and in terms of
30 comfort level of the patient.

Surrogate tumor markers, such as polynucleotide expression, can also be used to better classify, and thus diagnose and treat, different forms and disease states of cancer. Two classifications widely used in oncology that can benefit from identification of the expression levels of the polynucleotides of the invention are staging of the cancerous disorder, and grading the nature of the cancerous tissue.

Staging. Staging is a process used by physicians to describe how advanced the cancerous state is in a patient. Staging assists the physician in determining a prognosis, planning treatment and evaluating the results of such treatment. Different staging systems are used for different types of cancer, but each generally involves the following determinations: the type of tumor, indicated by T; whether the cancer has metastasized to nearby lymph nodes, indicated by N; and whether the cancer has metastasized to more distant parts of the body, indicated by M. This system of staging is called the TNM system. Generally, if a cancer is only detectable in the area of the primary lesion without having spread to any lymph nodes it is called Stage I. If it has spread only to the closest lymph nodes, it is called Stage II. In Stage III, the cancer has generally spread to the lymph nodes in near proximity to the site of the primary lesion. Cancers that have spread to a distant part of the body, such as the liver, bone, brain or another site, are called Stage IV, the most advanced stage.

Currently, the determination of staging is done using pathological techniques and is based more on the presence or absence of malignant tissue rather than the characteristics of the tumor type. Presence or absence of malignant tissue is based primarily on the gross morphology of the cells in the areas biopsied. The polynucleotides of the invention can facilitate fine-tuning of the staging process by identifying markers for the aggressivity of a cancer, *e.g.* the metastatic potential, as well as the presence in different areas of the body. Thus, a Stage II cancer with a polynucleotide signifying a high metastatic potential cancer can be used to change a borderline Stage II tumor to a Stage III tumor, justifying more aggressive therapy. Conversely, the presence of a polynucleotide signifying a lower metastatic potential allows more conservative staging of a tumor.

Grading of cancers. Grade is a term used to describe how closely a tumor resembles normal tissue of its same type. Based on the microscopic appearance of a tumor, pathologists will identify the grade of a tumor based on parameters such as cell morphology,

cellular organization, and other markers of differentiation. As a general rule, the grade of a tumor corresponds to its rate of growth or aggressiveness. That is, undifferentiated or high-grade tumors grow more quickly than well differentiated or low-grade tumors. Information about tumor grade is useful in planning treatment and predicting prognosis.

5 The American Joint Commission on Cancer has recommended the following guidelines for grading tumors: 1) GX Grade cannot be assessed; 2) G1 Well differentiated; G2 Moderately well differentiated; 3) G3 Poorly differentiated; 4) G4 Undifferentiated. Although grading is used by pathologists to describe most cancers, it plays a more important role in treatment planning for certain types than for others. An example is the Gleason
10 system that is specific for prostate cancer, which uses grade numbers to describe the degree of differentiation. Lower Gleason scores indicate well-differentiated cells. Intermediate scores denote tumors with moderately differentiated cells. Higher scores describe poorly differentiated cells. Grade is also important in some types of brain tumors and soft tissue sarcomas.

15 The polynucleotides of the invention can be especially valuable in determining the grade of the tumor, as they not only can aid in determining the differentiation status of the cells of a tumor, they can also identify factors other than differentiation that are valuable in determining the aggressivity of a tumor, such as metastatic potential.

20 Familial Cancer Genes. A number of cancer syndromes are linked to Mendelian inheritance of a predisposition to develop particular cancers. The following table contains a list of cancer types that can be inherited, and for which the gene or genes responsible have been identified. Most of the cancer types listed can occur as part of several different genetic conditions, each caused by alterations in a different gene.

Cancer Type	Genetic Condition	Gene
Brain	Li-Fraumeni syndrome	TP53
	Neurofibromatosis 1	NF1
	Neurofibromatosis 2	NF2
	von Hippel-Lindau syndrome	VHL
	Tuberous sclerosis 2	TSC2
Breast	Hereditary breast/ovarian cancer 1	BRCA1
	Hereditary breast/ovarian cancer 2	BRCA2
	Li-Fraumeni syndrome	TP53
	Ataxia telangiectasia	ATM
Colon	Familial adenomatous polyposis (FAP)	APC
	Hereditary non-polypoid colon cancer (HNPCC) 1	HMSH2
	Hereditary non-polypoid colon cancer (HNPCC) 2	hMLH1

Cancer Type	Genetic Condition	Gene
	Hereditary non-polyposis colon cancer (HNPCC) 3	hPMS1
Endocrine (parathyroid, pituitary, GI endocrine)	Hereditary non-polyposis colon cancer (HNPCC) 4	hPMS2
	Multiple endocrine neoplasia 1 (MEN1)	MEN1
Endocrine (pheochromocytoma, medullary thyroid)	Multiple endocrine neoplasia 2 (MEN2)	RET
Endometrial	Hereditary non-polyposis colon cancer (HNPCC) 1	hMSH2
	Hereditary non-polyposis colon cancer (HNPCC) 2	hMLH1
	Hereditary non-polyposis colon cancer (HNPCC) 3	hPMS1
	Hereditary non-polyposis colon cancer (HNPCC) 4	hPMS2
Eye	Hereditary retinoblastoma	RB1
Hematologic (lymphomas and leukemia)	Li-Fraumeni syndrome	TP53
	Ataxia telangiectasia	ATM
Kidney	Hereditary Wilms' tumor	WT1
	von Hippel-Lindau syndrome	VHL
	Tuberous sclerosis 2	TSC2
Ovary	Hereditary breast/ovarian cancer 1	BRCA1
	Hereditary breast/ovarian cancer 2	BRCA2
Sarcoma	Hereditary retinoblastoma	RB1
	Li-Fraumeni syndrome	TP53
	Neurofibromatosis 1	NF1
Skin	Hereditary melanoma 1	CDKN2
	Hereditary melanoma 2	CDK4
	Basal cell naevus (Gorlin) syndrome	PTCH
Stomach	Hereditary non-polyposis colon cancer (HNPCC) 1	hMSH2
	Hereditary non-polyposis colon cancer (HNPCC) 2	hMLH1
	Hereditary non-polyposis colon cancer (HNPCC) 3	hPMS1
	Hereditary non-polyposis colon cancer (HNPCC) 4	hPMS2

The polynucleotides of the invention can be especially useful to monitor patients having any of the above syndromes to detect potentially malignant events at a molecular level before they are detectable at a gross morphological level. As can be seen from the table, a number of genes are involved in multiple forms of cancer. Thus, a polynucleotide of the invention identified as important for metastatic colon cancer can also have clinical implications for a patient diagnosed with stomach cancer or endometrial cancer.

Lung Cancer. Lung cancer is one of the most common cancers in the United States, accounting for about 15 percent of all cancer cases, or 170,000 new cases each year. At this time, over half of the lung cancer cases in the United States are in men, but the number found in women is increasing and will soon equal that in men. Today more women die of lung cancer than of breast cancer. Lung cancer is especially difficult to diagnose and treat because of the large size of the lungs, which allows cancer to develop for years undetected.

In fact, lung cancer can spread outside the lungs without causing any symptoms. Adding to the confusion, the most common symptom of lung cancer, a persistent cough, can often be mistaken for a cold or bronchitis.

Although there are more than a dozen different kinds of lung cancer, the two main types of lung cancer are small cell and nonsmall cell, which encompass about 90% of all lung cancer cases. Small cell carcinoma (also called oat cell carcinoma), which usually starts in one of the larger bronchial tubes, grows fairly rapidly, and is likely to be large by the time of diagnosis. Nonsmall cell lung cancer (NSCLC) is made up of three general subtypes of lung cancer. Epidermoid carcinoma (also called squamous cell carcinoma) usually starts in one of the larger bronchial tubes and grows relatively slowly. The size of these tumors can range from very small to quite large. Adenocarcinoma starts growing near the outside surface of the lung and can vary in both size and growth rate. Some slowly growing adenocarcinomas are described as alveolar cell cancer. Large cell carcinoma starts near the surface of the lung, grows rapidly, and the growth is usually fairly large when diagnosed. Other less common forms of lung cancer are carcinoid, cylindroma, mucoepidermoid, and malignant mesothelioma.

Currently, CT scans, MRIs, X-rays, sputum cytology, and biopsies are used to diagnose nonsmall cell lung cancer. The form and cellular origin of the lung cancer is diagnosed primarily through biopsy from either a surgical biopsy or a needle aspiration of lung tissue, and usually the biopsy is prompted from an abnormality identified on an X-ray. In some cases, sputum cytology can reveal lung cancers in patients with normal X-rays or can determine the type of lung cancer, but because it cannot pinpoint the tumor's location, a positive sputum cytology test is usually followed by further tests. Since these tests are based in large part on gross morphology of the tissue, the diagnosis of a particular kind of tumor is largely subjective, and the diagnosis can vary significantly between clinicians.

The polynucleotides of the invention can be used to distinguish types of lung cancer as well as identifying traits specific to a certain patient's cancer. For example, if the patient's biopsy expresses a polynucleotide that is associated with a low metastatic potential, it may justify leaving a larger portion of the patient's lung in surgery to remove the lesion. Alternatively, a smaller lesion with expression of a polynucleotide that is associated with high metastatic potential may justify a more radical removal of lung tissue and/or the

surrounding lymph nodes, even if no metastasis can be identified through pathological examination.

Similarly, the expression of polynucleotides of the invention can be used in the diagnosis, prognosis and management of colorectal cancer. The differential expression of a polynucleotide in hyperplasia can be used as a diagnostic marker for metastatic lung cancer. The polynucleotides of the invention that would be especially useful for this purpose are those that exhibit differential expression between high metastatic versus low metastatic lung cancer, *i.e.* SEQ ID NOS: 9, 34, 42, 62, 74, 106, 119, 135, 154, 160, 260, 308, 323, 349, 361, 369, 371, 381, 395, and 400. Detection of malignant lung cancer with a higher metastatic potential can be determined using expression levels of any of these sequences alone or in combination with the levels of expression of other known genes.

Breast Cancer. The National Cancer Institute (NCI) estimates that about 1 in 8 women in the United States will develop breast cancer during her lifetime. Clinical breast examination and mammography are recommended as combined modalities for breast cancer screening, and the nature of the cancer will often depend upon the location of the tumor and the cell type from which the tumor is derived. The majority of breast cancers are adenocarcinomas subtypes, which can be summarized as follows:

Ductal carcinoma in situ (DCIS): Ductal carcinoma in situ is the most common type of noninvasive breast cancer. In DCIS, the malignant cells have not metastasized through the walls of the ducts into the fatty tissue of the breast. Comedocarcinoma is a type of DCIS that is more likely than other types of DCIS to come back in the same area after lumpectomy. It is more closely linked to eventual development of invasive ductal carcinoma than other forms of DCIS.

Infiltrating (or invasive) ductal carcinoma (IDC): this type of cancer has metastasized through the wall of the duct and invaded the fatty tissue of the breast. At this point, it has the potential to use the lymphatic system and bloodstream for metastasis to more distant parts of the body. Infiltrating ductal carcinoma accounts for about 80% of breast cancers.

Lobular carcinoma in situ (LCIS): While not a true cancer, LCIS (also called lobular neoplasia) is sometimes classified as a type of noninvasive breast cancer. It does not penetrate through the wall of the lobules. Although it does not itself usually become an

invasive cancer, women with this condition have a higher risk of developing an invasive breast cancer in the same breast, or in the opposite breast.

Infiltrating (or invasive) lobular carcinoma (ILC): ILC is similar to IDC, in that it has the potential metastasize elsewhere in the body. About 10% to 15% of invasive breast cancers are invasive lobular carcinomas. ILC can be more difficult to detect by mammogram than IDC.

Inflammatory breast cancer: This rare type of invasive breast cancer accounts for about 1% of all breast cancers and is extremely aggressive. Multiple skin symptoms associated with this cancer are caused by cancer cells blocking lymph vessels or channels in the skin over the breast.

Medullary carcinoma: This special type of infiltrating breast cancer has a relatively well defined, distinct boundary between tumor tissue and normal tissue. It accounts for about 5% of breast cancers. The prognosis for this kind of breast cancer is better than for other types of invasive breast cancer.

Mucinous carcinoma: This rare type of invasive breast cancer originates from mucus-producing cells. The prognosis for mucinous carcinoma is better than for the more common types of invasive breast cancer.

Paget's disease of the nipple: This type of breast cancer starts in the ducts and spreads to the skin of the nipple and the areola. It is a rare type of breast cancer, occurring in only 1% of all cases. Paget's disease can be associated with in situ carcinoma, or with infiltrating breast carcinoma. If no lump can be felt in the breast tissue, and the biopsy shows DCIS but no invasive cancer, the prognosis is excellent.

Phyllodes tumor: This very rare type of breast tumor forms from the stroma of the breast, in contrast to carcinomas which develop in the ducts or lobules. Phyllodes (also spelled phylloides) tumors are usually benign, but are malignant on rare occasions. Nevertheless, malignant phyllodes tumors are very rare and less than 10 women per year in the US die of this disease. Benign phyllodes tumors are successfully treated by removing the mass and a narrow margin of normal breast tissue.

Tubular carcinoma: Accounting for about 2% of all breast cancers, tubular carcinomas are a special type of infiltrating breast carcinoma. They have a better prognosis than usual infiltrating ductal or lobular carcinomas.

High-quality mammography combined with clinical breast exam remains the only screening method clearly tied to reduction in breast cancer mortality. Lower dose x-rays, digitized computer rather than film images, and the use of computer programs to assist diagnosis, are almost ready for widespread dissemination. Other technologies also are being developed, including magnetic resonance imaging and ultrasound. In addition, a very low radiation exposure technique, positron emission tomography has the potential for detecting early breast cancer.

It is also possible to differentiate between non-cancerous breast tissue and malignant breast tissue by analyzing differential gene expression between tissues. In addition, there may be several possible alterations that lead to the various possible types of breast cancer. The different types of breast tumors (*e.g.*, invasive vs. non-invasive, ductal vs. axillary lymph node) can be differentiable from one another by the identification of the differences in genes expressed by different types of breast tumor tissues (Porter-Jordan *et al.*, *Hematol Oncol Clin North Am* (1994) 8:73). Breast cancer can thus be generally diagnosed by detection of expression of a gene or genes associated with breast tumors. Where enough information is available about the differential gene expression between various types of breast tumor tissues, the specific type of breast tumor can also be diagnosed.

For example, increased estrogen receptor (ER) expression in normal breast epithelium, while not itself indicative of malignant tissue, is a known risk marker for development of breast cancer. Khan SA *et al.*, *Cancer Res* (1994) 54:993. Malignant breast cancer is often divided into two groups, ER-positive and ER-negative, based on the estrogen receptor status of the tissue. The ER status represents different survival length and response to hormone therapy, and is thought to represent either: 1) an indicator of different stages of the disease, or 2) an indicator that allows differentiation between two similar but distinct diseases. K. Zhu *et al.*, *Med. Hypoth.* (1997) 49:69. A number of other genes are known to vary expression between either different stages of cancer or different types of similar breast cancer.

Similarly, the expression of polynucleotides of the invention can be used in the diagnosis and management of breast cancer. The differential expression of a polynucleotide in human breast tumor tissue can be used as a diagnostic marker for human breast cancer. The polynucleotides of the invention that would be especially useful for this purpose are

those that exhibit differential expression between breast cancer tissue with a high metastatic potential and a low metastatic potential, *i.e.* SEQ ID NOS: 9, 42, 52, 62, 65, 66, 68, 114, 123, 144, 172, 178, 214, 219, 223, 258, 317, and 379. Detection of breast cancer can be determined using expression levels of any of these sequences alone or in combination.

- 5 Determination of the aggressive nature and/or the metastatic potential of a breast cancer can also be determined by comparing levels of one or more polynucleotides of the invention and comparing levels of another sequence known to vary in cancerous tissue, *e.g.* ER expression. In addition, development of breast cancer can be detected by examining the ratio of SEQ ID NO: to the levels of steroid hormones (*e.g.*, testosterone or estrogen) or to other hormones
10 (*e.g.*, growth hormone, insulin). Thus expression of specific marker polynucleotides can be used to discriminate between normal and cancerous breast tissue, to discriminate between breast cancers with different cells of origin, to discriminate between breast cancers with different potential metastatic rates, etc.

- Diagnosis of breast cancer can also involve comparing the expression of a
15 polynucleotide of the invention with the expression of other sequences in non-malignant breast tissue samples in comparison to one or more forms of the diseased tissue. A comparison of expression of one or more polynucleotides of the invention between the samples provides information on relative levels of these polynucleotides as well as the ratio of these polynucleotides to the expression of other sequences in the tissue of interest
20 compared to normal.

- This risk of breast cancer is elevated significantly by the presence of an inherited risk for breast cancer, such as a mutation in BRCA-1 or BRCA-2. New diagnostic tools are being developed to address the needs of higher risk patients to complement mammography and physical examinations for early detection of breast cancer, particularly among younger
25 women. The presence of antigen or expression markers in nipple aspirate fluid (NAF) samples collected from one or both breasts can be useful for useful for risk assessment or early cancer detection. Breast cytology and biomarkers obtained by random fine needle aspiration have been used to identify hyperplasia with atypia and overexpression of p53 and EGFR. The polynucleotides of the invention can be used in multivariate analysis with
30 expression studies with genes such as p53 and EGFR as risk predictors and as surrogate endpoint biomarkers for breast cancer.

As well as being used for diagnosis and risk assessment, the expression of certain genes can also correlated to prognosis of a disease state. The expression of particular gene have been used as prognostic indicators for breast cancer including increased expression of *c-erbB-2*, pS2, ER, progesterone receptor, epidermal growth factor receptor (EGFR), *neu*,
5 *myc*, *bcl-2*, *int2*, cytosolic tyrosine kinase, cyclin E, *prad-1*, *hst*, uPA, PAI-1, PAI-2, cathepsin D, as well as the presence of a number of cancer-specific antigens, e.g. CEA, CA M26, CA M29 and CA 15.3. Davis, *Br. J. Biomed Sci.* (1996) 53:157. Poor prognosis has also been linked to a decrease in expression of certain genes, such as *p53*, *Rb*, *nm23*. The expression of the polynucleotides of the invention can be of prognostic value for determining
10 the metastatic potential of a malignant breast cancer, as this molecules are differentially expressed between high and low metastatic potential tissues tumors. The levels of these polynucleotides in patients with malignant breast cancer can compared to normal tissue, malignant tissue with a known high potential metastatic level, and malignant tissue with a known lower level of metastatic potential to provide a prognosis for a particular patient.
15 Such a prognosis is predictive of the extent and nature of the cancer. The determined prognosis is useful in determining the prognosis of a patient with breast cancer, both for initial treatment of the disease and for longer-term monitoring of the same patient. If samples are taken from the same individual over a period of time, differences in polynucleotide expression that are specific to that patient can be identified and closely
20 watched.

Colon Cancer. Colorectal cancer is one of the most common neoplasms in humans and perhaps the most frequent form of hereditary neoplasia. Prevention and early detection are key factors in controlling and curing colorectal cancer. Indeed, colorectal cancer is the second most preventable cancer, after lung cancer. Colorectal cancer begins as polyps,
25 which are small, benign growths of cells that form on the inner lining of the colon. Over a period of several years, some of these polyps accumulate additional mutations and become cancerous. About 20 percent of all cases of colon cancer are thought to be related to heredity. Currently, multiple familial colorectal cancer disorders have been identified, which are summarized as follows:

30 Familial adenomatous polyposis (FAP): This condition results in a person having hundreds or even thousands of polyps in the colon and rectum that usually first appear during

the teenage years. Cancer nearly always develops in one or more of these polyps between the ages of 30 and 50.

Gardner's syndrome: Like FAP, Gardner's syndrome results in polyps and colorectal cancers that develop at a young age. It can also cause benign tumors of the skin, soft
5 connective tissue and bones.

Hereditary nonpolyposis colon cancer (HNPCC): People with this condition tend to develop colorectal cancer at a young age, without first having many polyps. HNPCC has an autosomal dominant pattern of inheritance with variable but high penetrance estimated to be about 90%. HNPCC underlies 0.5%-10% of all cases of colorectal cancer. An understanding
10 of the mechanisms behind the development of HNPCC is emerging, and genetic presymptomatic testing, now being conducted in research settings, soon will be available on a widespread basis for individuals identified at risk for this disease.

Familial colorectal cancer in Ashkenazi Jews: Recent research has found an inherited tendency to developing colorectal cancer among some Jews of Eastern European descent.
15 Like people with FAP, Gardner's syndrome, and HNPCC, their increased risk is due to an inherited mutation present in about 6% of American Jews.

Several tests are currently used to screen for colorectal cancer, including digital rectal examination, fecal occult blood test, sigmoidoscopy, colonoscopy, virtual colonoscopy and MRI. Each of these tests identifies potential colorectal cancer lesions, or a risk of
20 development of these lesions, at a fairly gross morphological level.

The sequential alteration of a number of genes is associated with malignant adenocarcinoma, including the genes DCC, p53, ras, and FAP. For a review, see e.g. Fearon ER, *et al.*, *Cell* (1990) 61(5):759; Hamilton SR *et al.*, *Cancer* (1993) 72:957; Bodmer W, *et al.*, *Nat Genet.* (1994) 4(3):217; Fearon ER, *Ann N Y Acad Sci.* (1995) 768:101. Molecular
25 genetic alterations are thus promising as potential diagnostic and prognostic indicators in colorectal carcinoma and molecular genetics of colorectal carcinoma since it is possible to differentiate between different types of colorectal neoplasias using molecular markers. Colorectal cancer can thus be generally diagnosed by detection of expression of a gene or genes associated with colorectal tumors.

30 Similarly, the expression of polynucleotides of the invention can be used in the diagnosis, prognosis and management of colorectal cancer. The differential expression of a

polynucleotide in hyperplasia can be used as a diagnostic marker for colon cancer. The polynucleotides of the invention that would be especially useful for this purpose are those that exhibit differential expression between malignant metastatic colon cancer and normal patient tissue, *i.e.* SEQ ID NOS: 52, 119, 172, 288. Detection of malignant colon cancer can be determined using expression levels of any of these sequences alone or in combination with the levels of expression.

Determination of the aggressive nature and/or the metastatic potential of a colon cancer can also be determined by comparing levels of one or more polynucleotides of the invention and comparing total levels of another sequence known to vary in cancerous tissue, *e.g.* p53 expression. In addition, development of colon cancer can be detected by examining the ratio of any of the polynucleotides of the invention to the levels of oncogenes (*e.g.* ras) or tumor suppressor genes (*e.g.* FAP or p53). Thus expression of specific marker polynucleotides can be used to discriminate between normal and cancerous breast tissue, to discriminate between breast cancers with different cells of origin, to discriminate between breast cancers with different potential metastatic rates, etc.

G. Use of Polynucleotides to Screen for Peptide Analogs and Antagonists

Polypeptides encoded by the instant polynucleotides and corresponding full length genes can be used to screen peptide libraries to identify binding partners, such as receptors, from among the encoded polypeptides.

A library of peptides can be synthesized following the methods disclosed in U.S. Pat. No. 5,010,175 ('175), and in WO 91/17823. As described below in brief, one prepares a mixture of peptides, which is then screened to identify the peptides exhibiting the desired signal transduction and receptor binding activity. In the '175 method, a suitable peptide synthesis support (*e.g.*, a resin) is coupled to a mixture of appropriately protected, activated amino acids. The concentration of each amino acid in the reaction mixture is balanced or adjusted in inverse proportion to its coupling reaction rate so that the product is an equimolar mixture of amino acids coupled to the starting resin. The bound amino acids are then deprotected, and reacted with another balanced amino acid mixture to form an equimolar mixture of all possible dipeptides. This process is repeated until a mixture of peptides of the desired length (*e.g.*, hexamers) is formed. Note that one need not include all amino acids in each step: one can include only one or two amino acids in some steps (*e.g.*, where it is

known that a particular amino acid is essential in a given position), thus reducing the complexity of the mixture. After the synthesis of the peptide library is completed, the mixture of peptides is screened for binding to the selected polypeptide. The peptides are then tested for their ability to inhibit or enhance activity. Peptides exhibiting the desired activity are then isolated and sequenced.

The method described in WO 91/17823 is similar. However, instead of reacting the synthesis resin with a mixture of activated amino acids, the resin is divided into twenty equal portions (or into a number of portions corresponding to the number of different amino acids to be added in that step), and each amino acid is coupled individually to its portion of resin.

The resin portions are then combined, mixed, and again divided into a number of equal portions for reaction with the second amino acid. In this manner, each reaction can be easily driven to completion. Additionally, one can maintain separate "subpools" by treating portions in parallel, rather than combining all resins at each step. This simplifies the process of determining which peptides are responsible for any observed receptor binding or signal transduction activity.

In such cases, the subpools containing, *e.g.*, 1-2,000 candidates each are exposed to one or more polypeptides of the invention. Each subpool that produces a positive result is then resynthesized as a group of smaller subpools (sub-subpools) containing, *e.g.*, 20-100 candidates, and reassayed. Positive sub-subpools can be resynthesized as individual compounds, and assayed finally to determine the peptides that exhibit a high binding constant. These peptides can be tested for their ability to inhibit or enhance the native activity. The methods described in WO 91/7823 and U.S. Patent No. 5,194,392 (herein incorporated by reference) enable the preparation of such pools and subpools by automated techniques in parallel, such that all synthesis and resynthesis can be performed in a matter of days.

Peptide agonists or antagonists are screened using any available method, such as signal transduction, antibody binding, receptor binding, mitogenic assays, chemotaxis assays, etc. The methods described herein are presently preferred. The assay conditions ideally should resemble the conditions under which the native activity is exhibited *in vivo*, that is, under physiologic pH, temperature, and ionic strength. Suitable agonists or antagonists will exhibit strong inhibition or enhancement of the native activity at

concentrations that do not cause toxic side effects in the subject. Agonists or antagonists that compete for binding to the native polypeptide can require concentrations equal to or greater than the native concentration, while inhibitors capable of binding irreversibly to the polypeptide can be added in concentrations on the order of the native concentration.

5 The end results of such screening and experimentation will be at least one novel polypeptide binding partner, such as a receptor, encoded by a gene or a cDNA corresponding to a polynucleotide of the invention, and at least one peptide agonist or antagonist of the novel binding partner. Such agonists and antagonists can be used to modulate, enhance, or inhibit receptor function in cells to which the receptor is native, or in cells that possess the
10 receptor as a result of genetic engineering. Further, if the novel receptor shares biologically important characteristics with a known receptor, information about agonist/antagonist binding can facilitate development of improved agonists/antagonists of the known receptor.

H. Pharmaceutical Compositions and Therapeutic Uses

Pharmaceutical compositions can comprise polypeptides, antibodies, or
15 polynucleotides of the claimed invention. The pharmaceutical compositions will comprise a therapeutically effective amount of either polypeptides, antibodies, or polynucleotides of the claimed invention.

 The term "therapeutically effective amount" as used herein refers to an amount of a therapeutic agent to treat, ameliorate, or prevent a desired disease or condition, or to exhibit a
20 detectable therapeutic or preventative effect. The effect can be detected by, for example, chemical markers or antigen levels. Therapeutic effects also include reduction in physical symptoms, such as decreased body temperature. The precise effective amount for a subject will depend upon the subject's size and health, the nature and extent of the condition, and the therapeutics or combination of therapeutics selected for administration. Thus, it is not useful
25 to specify an exact effective amount in advance. However, the effective amount for a given situation is determined by routine experimentation and is within the judgment of the clinician. For purposes of the present invention, an effective dose will generally be from about 0.01 mg/ kg to 50 mg/kg or 0.05 mg/kg to about 10 mg/kg of the DNA constructs in the individual to which it is administered.

30 A pharmaceutical composition can also contain a pharmaceutically acceptable carrier. The term "pharmaceutically acceptable carrier" refers to a carrier for administration of a

therapeutic agent, such as antibodies or a polypeptide, genes, and other therapeutic agents.

The term refers to any pharmaceutical carrier that does not itself induce the production of antibodies harmful to the individual receiving the composition, and which can be

administered without undue toxicity. Suitable carriers can be large, slowly metabolized

5 macromolecules such as proteins, polysaccharides, polylactic acids, polyglycolic acids, polymeric amino acids, amino acid copolymers, and inactive virus particles. Such carriers are well known to those of ordinary skill in the art.

Pharmaceutically acceptable salts can be used therein, for example, mineral acid salts such as hydrochlorides, hydrobromides, phosphates, sulfates, and the like; and the salts of
10 organic acids such as acetates, propionates, malonates, benzoates, and the like. A thorough discussion of pharmaceutically acceptable excipients is available in *Remington's Pharmaceutical Sciences* (Mack Pub. Co., N.J. 1991).

Pharmaceutically acceptable carriers in therapeutic compositions can include liquids such as water, saline, glycerol and ethanol. Auxiliary substances, such as wetting or
15 emulsifying agents, pH buffering substances, and the like, can also be present in such vehicles. Typically, the therapeutic compositions are prepared as injectables, either as liquid solutions or suspensions; solid forms suitable for solution in, or suspension in, liquid vehicles prior to injection can also be prepared. Liposomes are included within the definition of a pharmaceutically acceptable carrier.

20 Delivery Methods. Once formulated, the compositions of the invention can be (1) administered directly to the subject (*e.g.*, as polynucleotide or polypeptides); (2) delivered *ex vivo*, to cells derived from the subject (*e.g.*, as in *ex vivo* gene therapy); or (3) delivered *in vitro* for expression of recombinant proteins (*e.g.*, polynucleotides). Direct delivery of the compositions will generally be accomplished by injection, either
25 subcutaneously, intraperitoneally, intravenously or intramuscularly, or delivered to the interstitial space of a tissue. The compositions can also be administered into a tumor or lesion. Other modes of administration include oral and pulmonary administration, suppositories, and transdermal applications, needles, and gene guns or hyposprays. Dosage treatment can be a single dose schedule or a multiple dose schedule.

30 Methods for the *ex vivo* delivery and reimplantation of transformed cells into a subject are known in the art and described in *e.g.*, International Publication No. WO

93/14778. Examples of cells useful in ex vivo applications include, for example, stem cells, particularly hematopoietic, lymph cells, macrophages, dendritic cells, or tumor cells.

Generally, delivery of nucleic acids for both ex vivo and in vitro applications can be accomplished by, for example, dextran-mediated transfection, calcium phosphate

5 precipitation, polybrene mediated transfection, protoplast fusion, electroporation, encapsulation of the polynucleotide(s) in liposomes, and direct microinjection of the DNA into nuclei, all well known in the art.

Once a gene corresponding to a polynucleotide of the invention has been found to correlate with a proliferative disorder, such as neoplasia, dysplasia, and hyperplasia, the
10 disorder can be amenable to treatment by administration of a therapeutic agent based on the provided polynucleotide or corresponding polypeptide.

Preparation of antisense polynucleotides is discussed above. Neoplasias that are treated with the antisense composition include, but are not limited to, cervical cancers, melanomas, colorectal adenocarcinomas, Wilms' tumor, retinoblastoma, sarcomas,
15 myosarcomas, lung carcinomas, leukemias, such as chronic myelogenous leukemia, promyelocytic leukemia, monocytic leukemia, and myeloid leukemia, and lymphomas, such as histiocytic lymphoma. Proliferative disorders that are treated with the therapeutic composition include disorders such as anhydric hereditary ectodermal dysplasia, congenital alveolar dysplasia, epithelial dysplasia of the cervix, fibrous dysplasia of bone, and
20 mammary dysplasia. Hyperplasias, for example, endometrial, adrenal, breast, prostate, or thyroid hyperplasias or pseudoepitheliomatous hyperplasia of the skin, are treated with antisense therapeutic compositions based upon a polynucleotide of the invention. Even in disorders in which mutations in the corresponding gene are not implicated, downregulation or inhibition of expression of a gene corresponding to a polynucleotide of the invention can
25 have therapeutic application. For example, decreasing gene expression can help to suppress tumors in which enhanced expression of the gene is implicated.

Both the dose of the antisense composition and the means of administration are determined based on the specific qualities of the therapeutic composition, the condition, age, and weight of the patient, the progression of the disease, and other relevant factors.
30 Administration of the therapeutic antisense agents of the invention includes local or systemic administration, including injection, oral administration, particle gun or catheterized

administration, and topical administration. Preferably, the therapeutic antisense composition contains an expression construct comprising a promoter and a polynucleotide segment of at least 12, 22, 25, 30, or 35 contiguous nucleotides of the antisense strand of a polynucleotide disclosed herein. Within the expression construct, the polynucleotide segment is located downstream from the promoter, and transcription of the polynucleotide segment initiates at the promoter.

Various methods are used to administer the therapeutic composition directly to a specific site in the body. For example, a small metastatic lesion is located and the therapeutic composition injected several times in several different locations within the body of tumor. Alternatively, arteries which serve a tumor are identified, and the therapeutic composition injected into such an artery, in order to deliver the composition directly into the tumor. A tumor that has a necrotic center is aspirated and the composition injected directly into the now empty center of the tumor. The antisense composition is directly administered to the surface of the tumor, for example, by topical application of the composition. X-ray imaging is used to assist in certain of the above delivery methods.

Receptor-mediated targeted delivery of therapeutic compositions containing an antisense polynucleotide, subgenomic polynucleotides, or antibodies to specific tissues is also used. Receptor-mediated DNA delivery techniques are described in, for example, Findeis *et al.*, *Trends Biotechnol.* (1993) 11:202; Chiou *et al.*, *Gene Therapeutics: Methods And Applications Of Direct Gene Transfer* (J.A. Wolff, ed.) (1994); Wu *et al.*, *J. Biol. Chem.* (1988) 263:621; Wu *et al.*, *J. Biol. Chem.* (1994) 269:542; Zenke *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1990) 87:3655; Wu *et al.*, *J. Biol. Chem.* (1991) 266:338. Preferably, receptor-mediated targeted delivery of therapeutic compositions containing antibodies of the invention is used to deliver the antibodies to specific tissue.

Therapeutic compositions containing antisense subgenomic polynucleotides are administered in a range of about 100 ng to about 200 mg of DNA for local administration in a gene therapy protocol. Concentration ranges of about 500 ng to about 50 mg, about 1 µg to about 2 mg, about 5 µg to about 500 µg, and about 20 µg to about 100 µg of DNA can also be used during a gene therapy protocol. Factors such as method of action and efficacy of transformation and expression are considerations which will affect the dosage required for ultimate efficacy of the antisense subgenomic polynucleotides. Where greater expression is

desired over a larger area of tissue, larger amounts of antisense subgenomic polynucleotides or the same amounts readministered in a successive protocol of administrations, or several administrations to different adjacent or close tissue portions of, for example, a tumor site, may be required to effect a positive therapeutic outcome. In all cases, routine
5 experimentation in clinical trials will determine specific ranges for optimal therapeutic effect. A more complete description of gene therapy vectors, especially retroviral vectors, is contained in U.S. Serial No. 08/869,309, which is expressly incorporated herein, and in section G below.

For polynucleotide-related genes encoding polypeptides or proteins with anti-
10 inflammatory activity, suitable use, doses, and administration are described in U.S. Patent No. 5,654,173. Therapeutic agents also include antibodies to proteins and polypeptides encoded by the polynucleotides of the invention and related genes, as described in U.S. Patent No. 5,654,173.

I. Gene Therapy

15 The therapeutic polynucleotides and polypeptides of the present invention can be utilized in gene delivery vehicles. The gene delivery vehicle can be of viral or non-viral origin (see generally, Jolly, *Cancer Gene Therapy* (1994) 1:51; Kimura, *Human Gene Therapy* (1994) 5:845; Connelly, *Human Gene Therapy* (1995) 1:185; and Kaplitt, *Nature Genetics* (1994) 6:148). Gene therapy vehicles for delivery of constructs including a coding
20 sequence of a therapeutic of the invention can be administered either locally or systemically. These constructs can utilize viral or non-viral vector approaches. Expression of such coding sequences can be induced using endogenous mammalian or heterologous promoters. Expression of the coding sequence can be either constitutive or regulated.

The present invention can employ recombinant retroviruses which are constructed to
25 carry or express a selected nucleic acid molecule of interest. Retrovirus vectors that can be employed include those described in EP 0 415 731; WO 90/07936; WO 94/03622; WO 93/25698; WO 93/25234; U.S. Patent No. 5, 219,740; WO 93/11230; WO 93/10218; Vile and Hart, *Cancer Res.* (1993) 53:3860; Vile *et al.*, *Cancer Res.* (1993) 53:962; Ram *et al.*, *Cancer Res.* (1993) 53:83; Takamiya *et al.*, *J. Neurosci. Res.* (1992) 33:493; Baba *et al.*, *J. Neurosurg.* (1993) 79:729; U.S. Patent No. 4,777,127; GB Patent No. 2,200,651; and EP 0
30 345 242. Preferred recombinant retroviruses include those described in WO 91/02805.

Packaging cell lines suitable for use with the above-described retroviral vector constructs can be readily prepared (see, *e.g.*, WO 95/30763 and WO 92/05266), and used to create producer cell lines (also termed vector cell lines) for the production of recombinant vector particles. Within particularly preferred embodiments of the invention, packaging cell lines are made from human (such as HT1080 cells) or mink parent cell lines, thereby allowing production of recombinant retroviruses that can survive inactivation in human serum.

The present invention also employs alphavirus-based vectors that can function as gene delivery vehicles. Such vectors can be constructed from a wide variety of alphaviruses, including, for example, Sindbis virus vectors, Semliki forest virus (ATCC VR-67; ATCC VR-1247), Ross River virus (ATCC VR-373; ATCC VR-1246) and Venezuelan equine encephalitis virus (ATCC VR-923; ATCC VR-1250; ATCC VR 1249; ATCC VR-532). Representative examples of such vector systems include those described in U.S. Patent Nos. 5,091,309; 5,217,879; and 5,185,440; WO 92/10578; WO 94/21792; WO 95/27069; WO 95/27044; and WO 95/07994. Gene delivery vehicles of the present invention can also employ parvovirus such as adeno-associated virus (AAV) vectors. Representative examples include the AAV vectors disclosed by Srivastava in WO 93/09239, Samulski *et al.*, *J. Virol.* (1989) 63:3822; Mendelson *et al.*, *Virol.* (1988) 166:154; and Flotte *et al.*, *PNAS* (1993) 90:10613.

Representative examples of adenoviral vectors include those described by Berkner, *Biotechniques* (1988) 6:616; Rosenfeld *et al.*, *Science* (1991) 252:431; WO 93/19191; Kolls *et al.*, *PNAS* (1994) 91:215; Kass-Eisler *et al.*, *PNAS* (1993) 90:11498; Guzman *et al.*, *Circulation* (1993) 88:2838; Guzman *et al.*, *Cir. Res.* (1993) 73:1202; Zabner *et al.*, *Cell* (1993) 75:207; Li *et al.*, *Hum. Gene Ther.* (1993) 4:403; Cailaud *et al.*, *Eur. J. Neurosci.* (1993) 5:1287; Vincent *et al.*, *Nat. Genet.* (1993) 5:130; Jaffe *et al.*, *Nat. Genet.* (1992) 1:372; and Levrero *et al.*, *Gene* (1991) 101:195. Exemplary adenoviral gene therapy vectors employable in this invention also include those described in WO 94/12649, WO 93/03769; WO 93/19191; WO 94/28938; WO 95/11984 and WO 95/00655. Administration of DNA linked to killed adenovirus as described in Curiel, *Hum. Gene Ther.* (1992) 3:147 can be employed.

Other gene delivery vehicles and methods can be employed, including polycationic condensed DNA linked or unlinked to killed adenovirus alone, for example Curiel, *Hum.*

Gene Ther. (1992) 3:147; ligand linked DNA, for example see Wu, *J. Biol. Chem.* (1989) 264:16985; eukaryotic cell delivery vehicles cells, for example see U.S. Pat. No. 5,814,482;

5 WO 95/07994; WO 96/17072; WO 95/30763; and WO 97/42338; deposition of photopolymerized hydrogel materials; hand-held gene transfer particle gun, as described in U.S. Patent No. 5,149,655; ionizing radiation as described in U.S. Patent No. 5,206,152 and in WO92/11033; nucleic charge neutralization or fusion with cell membranes. Additional approaches are described in Philip, *Mol. Cell Biol.* (1994) 14:2411, and in Woffendin, *Proc.*
10 *Natl. Acad. Sci.* (1994) 91:1581.

Naked DNA can also be employed. Exemplary naked DNA introduction methods are described in WO 90/11092 and U.S. Patent No. 5,580,859. Uptake efficiency can be improved using biodegradable latex beads. DNA coated latex beads are efficiently transported into cells after endocytosis initiation by the beads. The method can be improved
15 further by treatment of the beads to increase hydrophobicity and thereby facilitate disruption of the endosome and release of the DNA into the cytoplasm. Liposomes that can act as gene delivery vehicles are described in U.S. Patent No. 5,422,120; WO 95/13796; WO 94/23697; WO 91/14445; and EP 0524968.

Further non-viral delivery suitable for use includes mechanical delivery systems such
20 as the approach described in Woffendin *et al.*, *Proc. Natl. Acad. Sci. USA* (1994) 91(24):11581. Moreover, the coding sequence and the product of expression of such can be delivered through deposition of photopolymerized hydrogel materials. Other conventional methods for gene delivery that can be used for delivery of the coding sequence include, for example, use of hand-held gene transfer particle gun, as described in U.S. Patent No.
25 5,149,655; use of ionizing radiation for activating transferred gene, as described in U.S. Patent No. 5,206,152 and WO 92/11033.

The present invention will now be illustrated by reference to the following examples which set forth particularly advantageous embodiments. However, it should be noted that these embodiments are illustrative and are not to be construed as restricting the invention in
30 any way.

EXAMPLES

The present invention is now illustrated by reference to the following examples which set forth particularly advantageous embodiments. However, these embodiments are illustrative and are not meant to be construed as restricting the invention in any way.

5

Example 1: Source of Biological Materials and Overview of Novel Polynucleotides Expressed by the Biological Materials

Human colon cancer cell line Km12L4-A (Morika, W. A. K. et al., *Cancer Research* (1988) 48:6863) was used to construct a cDNA library from mRNA isolated from the cells.

- 10 As described in the above overview, a total of 4,693 sequences expressed by the Km12L4-A cell line were isolated and analyzed; most sequences were about 275-300 nucleotides in length. The KM12L4-A cell line is derived from the KM12C cell line. The KM12C cell line, which is poorly metastatic (low metastatic) was established in culture from a Dukes' stage B₂ surgical specimen (Morikawa et al. *Cancer Res.* (1988) 48:6863). The KML4-A is
15 a highly metastatic subline derived from KM12C (Yeatman et al. *Nucl. Acids. Res.* (1995) 23:4007; Bao-Ling et al. *Proc. Annu. Meet. Am. Assoc. Cancer. Res.* (1995) 21:3269). The KM12C and KM12C-derived cell lines (e.g., KM12L4, KM12L4-A, etc.) are well-recognized in the art as a model cell line for the study of colon cancer (see, e.g., Moriakawa et al., *supra*; Radinsky et al. *Clin. Cancer Res.* (1995) 1:19; Yeatman et al., (1995) *supra*;
20 Yeatman et al. *Clin. Exp. Metastasis* (1996) 14:246).

The sequences were first masked to eliminate low complexity sequences using the XBLAST masking program (Claverie "Effective Large-Scale Sequence Similarity Searches," In: Computer Methods for Macromolecular Sequence Analysis, Doolittle, ed., *Meth. Enzymol.* 266:212-227 Academic Press, NY, NY (1996); see particularly Claverie, in "Automated
25 DNA Sequencing and Analysis Techniques" Adams et al., eds., Chap. 36, p. 267 Academic Press, San Diego, 1994 and Claverie et al. *Comput. Chem.* (1993) 17:191). Generally, masking does not influence the final search results, except to eliminate of relative little interest due to their low complexity, and to eliminate multiple "hits" based on similarity to repetitive regions common to multiple sequences, e.g., Alu repeats. Masking resulted in the
30 elimination of 43 sequences. The remaining sequences were then used in a BLASTN vs. Genbank search with search parameters of greater than 70% overlap, 99% identity, and a p value of less than 1×10^{-40} , which search resulted in the discarding of 1,432 sequences. Sequences from this search also were discarded if the inclusive parameters were met, but the sequence was ribosomal or vector-derived.

The resulting sequences from the previous search were classified into three groups (1, 2 and 3 below) and searched in a BLASTX vs. NRP (non-redundant proteins) database search: (1) unknown (no hits in the Genbank search), (2) weak similarity (greater than 45% identity and p value of less than 1×10^{-5}), and (3) high similarity (greater than 60% overlap, greater than 80% identity, and p value less than 1×10^{-5}). This search resulted in discard of 98 sequences as having greater than 70% overlap, greater than 99% identity, and p value of less than 1×10^{-40} .

The remaining sequences were classified as unknown (no hits), weak similarity, and high similarity (parameters as above). Two searches were performed on these sequences.

First, a BLAST vs. EST database search resulted in discard of 1771 sequences (sequences with greater than 99% overlap, greater than 99% similarity and a p value of less than 1×10^{-40} ; sequences with a p value of less than 1×10^{-65} when compared to a database sequence of human origin were also excluded). Second, a BLASTN vs. Patent GeneSeq database resulted in discard of 15 sequences (greater than 99% identity; p value less than 1×10^{-40} ; greater than 99% overlap).

The remaining sequences were subjected to screening using other rules and redundancies in the dataset. Sequences with a p value of less than 1×10^{-111} in relation to a database sequence of human origin were specifically excluded. The final result provided the 404 sequences listed in the accompanying Sequence Listing. The Sequence Listing is arranged beginning with sequences with no similarity to any sequence in a database searched, and ending with sequences with the greatest similarity. Each identified polynucleotide represents sequence from at least a partial mRNA transcript. Polynucleotides that were determined to be novel were assigned a sequence identification number.

The novel polynucleotides and were assigned sequence identification numbers SEQ ID NOS: 1-404. The DNA sequences corresponding to the novel polynucleotides are provided in the Sequence Listing. The majority of the sequences are presented in the Sequence Listing in the 5' to 3' direction. A small number, 25, are listed in the Sequence Listing in the 5' to 3' direction but the sequence as written is actually 3' to 5'. These sequences are readily identified with the designation "AR" in the Sequence Name in Table 1 (inserted before the claims). The sequences correctly listed in the 5' to 3' direction in the Sequence Listing are designated "AF." The Sequence Listing filed herewith therefore contains 25 sequences listed in the reverse order, namely SEQ ID NOS:47, 97, 137, 171, 173, 179, 182, 194, 200, 202, 213, 227, 258, 264, 275, 302, 313, 324, 329, 330, 331, 338, 358, 379, and 404.

Because the provided polynucleotides represent partial mRNA transcripts, two or more polynucleotides of the invention may represent different regions of the same mRNA transcript and the same gene. Thus, if two or more SEQ ID NOS: are identified as belonging to the same clone, then either sequence can be used to obtain the full-length mRNA or gene.

5 In order to confirm the sequences of SEQ ID NOS:1-404, inserts of the clones corresponding to these polynucleotides were re-sequenced. These "validation" sequences are provided in SEQ ID NOS:405-800. These validation sequences were often longer than the original polynucleotide sequences. They validate, and thus often provide additional sequence information. Validation sequences can be correlated with the original sequences
10 they validate by identifying those sequences of SEQ ID NOS:1-404 and the validation sequences of SEQ ID NOS:405-800 that share the same clone name in Table 1.

Example 2: Results of Public Database Search to Identify Function of Gene Products

SEQ ID NOS:1-404, as well as the validation sequences SEQ ID NOS:405-800, were
15 translated in all three reading frames to determine the best alignment with the individual sequences. These amino acid sequences and nucleotide sequences are referred, generally, as query sequences, which are aligned with the individual sequences. Query and individual sequences were aligned using the BLAST programs, available over the world wide web at <http://www.ncbi.nlm.nih.gov/BLAST/>. Again the sequences were masked to various extents
20 to prevent searching of repetitive sequences or poly-A sequences, using the XBLAST program for masking low complexity as described above in Example 1.

Table 2 (inserted before the claims) shows the results of the alignments. Table 2 refers to each sequence by its SEQ ID NO:, the accession numbers and descriptions of nearest neighbors from the Genbank and Non-Redundant Protein searches, and the p values
25 of the search results. Table 1 identifies each SEQ ID NO: by SEQ name, clone ID, and cluster. As discussed above, a single cluster includes polynucleotides representing the same gene or gene family, and generally represents sequences encoding the same gene product.

For each of SEQ ID NOS:1-800, the best alignment to a protein or DNA sequence is included in Table 2. The activity of the polypeptide encoded by SEQ ID NOS:1-800 is the
30 same or similar to the nearest neighbor reported in Table 2. The accession number of the nearest neighbor is reported, providing a reference to the activities exhibited by the nearest neighbor. The search program and database used for the alignment also are indicated as well as a calculation of the p value.

Full length sequences or fragments of the polynucleotide sequences of the nearest neighbors can be used as probes and primers to identify and isolate the full length sequence of SEQ ID NOS:1-800. The nearest neighbors can indicate a tissue or cell type to be used to construct a library for the full-length sequences of SEQ ID NOS:1-800.

- 5 SEQ ID NOS:1-800 and the translations thereof may be human homologs of known genes of other species or novel allelic variants of known human genes. In such cases, these new human sequences are suitable as diagnostics or therapeutics. As diagnostics, the human sequences SEQ ID NOS:1-800 exhibit greater specificity in detecting and differentiating human cell lines and types than homologs of other species. The human polypeptides
- 10 encoded by SEQ ID NOS:1-800 are likely to be less immunogenic when administered to humans than homologs from other species. Further, on administration to humans, the polypeptides encoded by SEQ ID NOS:1-800 can show greater specificity or can be better regulated by other human proteins than are homologs from other species.

15 **Example 3: Members of Protein Families**

After conducting a profile search as described in the specification above, several of the polynucleotides of the invention were found to encode polypeptides having characteristics of a polypeptide belonging to a known protein families (and thus represent new members of these protein families) and/or comprising a known functional domain (Table 3). Thus the

20 invention encompasses fragments, fusions, and variants of such polynucleotides that retain biological activity associated with the protein family and/or functional domain identified herein.

Table 3 Polynucleotides encoding gene products of a protein family or having a known functional domain(s).

SEQ ID NO:	Biological Activity (Profile hit)	Start	Stop	Dir
24	4 transmembrane segments integral membrane proteins	1218	578	rev
41	4 transmembrane segments integral membrane proteins	1086	413	rev
101	4 transmembrane segments integral membrane proteins	1206	544	rev
157	4 transmembrane segments integral membrane proteins	721	33	rev
341	4 transmembrane segments integral membrane proteins	1253	613	rev
395	4 transmembrane segments integral membrane proteins	530	10	for
395	4 transmembrane segments integral membrane proteins	696	17	for
395	4 transmembrane segments integral membrane proteins	471	39	rev
24	7 transmembrane receptor (Secretin family)	1301	491	rev
41	7 transmembrane receptor (Secretin family)	1309	10	rev
101	7 transmembrane receptor (Secretin family)	1330	296	rev
157	7 transmembrane receptor (Secretin family)	1173	249	rev
291	7 transmembrane receptor (Secretin family)	1400	269	rev

Table 3 Polynucleotides encoding gene products of a protein family or having a known functional domain(s).

SEQ ID NO:	Biological Activity (Profile hit)	Start	Stop	Dir
291	7 transmembrane receptor (Secretin family)	712	130	for
305	7 transmembrane receptor (Secretin family)	926	4	for
305	7 transmembrane receptor (Secretin family)	753	55	rev
315	7 transmembrane receptor (Secretin family)	1058	270	rev
341	7 transmembrane receptor (Secretin family)	1265	534	rev
116	Ank repeat	141	218	for
251	Ank repeat	290	207	for
251	Ank repeat	467	387	for
63	ATPases Associated with Various Cellular Activities	543	60	for
116	ATPases Associated with Various Cellular Activities	802	313	for
134	ATPases Associated with Various Cellular Activities	525	57	rev
136	ATPases Associated with Various Cellular Activities	712	163	for
151	ATPases Associated with Various Cellular Activities	719	73	for
151	ATPases Associated with Various Cellular Activities	386	13	for
384	ATPases Associated with Various Cellular Activities	664	140	for
404	ATPases Associated with Various Cellular Activities	704	52	for
374	Basic region plus leucine zipper transcription factors	298	146	for
97	Bromodomain (conserved sequence found in human, Drosophila and yeast proteins.)	230	63	for
136	EF-hand	121	207	for
242	EF-hand	238	155	for
379	EF-hand	212	126	for
308	Eukaryotic aspartyl proteases	1300	461	rev
213	GATA family of transcription factors	720	377	for
367	G-protein alpha subunit	971	467	rev
188	Phorbol esters/diacylglycerol binding	91	177	for
251	Phorbol esters/diacylglycerol binding	133	219	for
202	protein kinase	482	1	rev
202	protein kinase	970	1	rev
315	protein kinase	739	158	for
315	protein kinase	1023	197	for
367	protein kinase	1046	285	rev
397	protein kinase	511	6	for
256	Protein phosphatase 2C	13	90	for
256	Protein phosphatase 2C	163	86	for
382	Protein Tyrosine Phosphatase	261	2	for
306	SH3 Domain	141	296	for
386	SH3 Domain	359	209	for
169	Trypsin	764	164	rev
188	WD domain, G-beta repeats	480	382	for
188	WD domain, G-beta repeats	206	117	for
335	WD domain, G-beta repeats	3	92	for
23	wnt family of developmental signaling proteins	1151	335	rev
291	wnt family of developmental signaling proteins	779	89	rev
291	wnt family of developmental signaling proteins	1347	382	rev
324	wnt family of developmental signaling proteins	1180	499	rev
330	wnt family of developmental signaling proteins	1180	499	rev
341	wnt family of developmental signaling proteins	1399	560	rev

Table 3 Polynucleotides encoding gene products of a protein family or having a known functional domain(s).

SEQ ID NO:	Biological Activity (Profile hit)	Start	Stop	Dir
353	wnt family of developmental signaling proteins	880	49	rev
188	WW/rsp5/WWP domain containing proteins	431	354	for
379	WW/rsp5/WWP domain containing proteins	12	89	for
395	WW/rsp5/WWP domain containing proteins	153	76	for
395	WW/rsp5/WWP domain containing proteins	156	64	for
61	Zinc finger, C2H2 type	254	192	for
306	Zinc finger, C2H2 type	428	367	for
386	Zinc finger, C2H2 type	191	253	for
322	Zinc finger, CCHC class	553	503	for
306	Zinc-binding metalloprotease domain	101	60	rev
395	Zinc-binding metalloprotease domain	28	69	rev

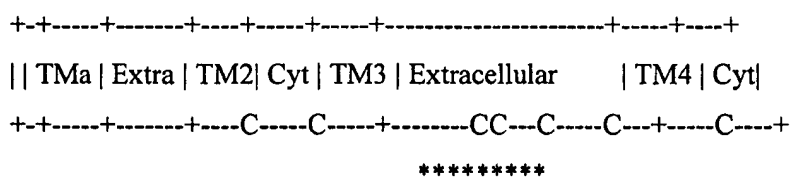
Start and stop indicate the position within the individual sequences that align with the query sequence having the indicated SEQ ID NO. The direction (Dir) indicates the orientation of the query sequence with respect to the individual sequence, where forward (for) indicates that the alignment is in the same direction (left to right) as the sequence provided in the Sequence Listing and reverse (rev) indicates that the alignment is with a sequence complementary to the sequence provided in the Sequence Listing.

Some polynucleotides exhibited multiple profile hits because, for example, the particular sequence contains overlapping profile regions, and/or the sequence contains two different functional domains. These profile hits are described in more detail below.

a) Four Transmembrane Integral Membrane Proteins. SEQ ID NOS: 24, 41, 101, 157, 341, and 395 correspond to a sequence encoding a polypeptide that is a member of the 4 transmembrane segments integral membrane protein family (transmembrane 4 family). The transmembrane 4 family of proteins includes a number of evolutionarily-related eukaryotic cell surface antigens (Levy *et al.*, *J. Biol. Chem.*, (1991) 266:14597; Tomlinson *et al.*, *Eur. J. Immunol.* (1993) 23:136; Barclay *et al.* The leucocyte antigen factbooks. (1993) Academic Press, London/San Diego). The proteins belonging to this family include: 1) Mammalian antigen CD9 (MIC3), which is involved in platelet activation and aggregation; 2) Mammalian leukocyte antigen CD37, expressed on B lymphocytes; 3) Mammalian leukocyte antigen CD53 (OX-44), which is implicated in growth regulation in hematopoietic cells; 4) Mammalian lysosomal membrane protein CD63 (melanoma-associated antigen ME491; antigen AD1); 5) Mammalian antigen CD81 (cell surface protein TAPA-1), which is implicated in regulation of lymphoma cell growth; 6) Mammalian antigen CD82 (protein

R2; antigen C33; Kangai 1 (KAI1)), which associates with CD4 or CD8 and delivers costimulatory signals for the TCR/CD3 pathway; 7) Mammalian antigen CD151 (SFA-1; platelet-endothelial tetraspan antigen 3 (PETA-3)); 8) Mammalian cell surface glycoprotein A15 (TALLA-1; MXS1); 9) Mammalian novel antigen 2 (NAG-2); 10) Human tumor-associated antigen CO-029; 11) *Schistosoma mansoni* and *japonicum* 23 Kd surface antigen (SM23 / SJ23).

The members of the 4 transmembrane family share several characteristics. First, they all are apparently type III membrane proteins, which are integral membrane proteins containing an N-terminal membrane-anchoring domain which is not cleaved during biosynthesis and which functions both as a translocation signal and as a membrane anchor. The family members also contain three additional transmembrane regions, at least seven conserved cysteines residues, and are of approximately the same size (218 to 284 residues). These proteins are collectively know as the "transmembrane 4 superfamily" (TM4) because they span plasma membrane four times. A schematic diagram of the domain structure of these proteins is as follows:



where Cyt is the cytoplasmic domain, TMa is the transmembrane anchor; TM2 to TM4 represents transmembrane regions 2 to 4, 'C' are conserved cysteines, and '*' indicates the position of the consensus pattern. The consensus pattern spans a conserved region including two cysteines located in a short cytoplasmic loop between two transmembrane domains: Consensus pattern: G-x(3)-[LIVMF]-x(2)-[GSA]-[LIVMF](2)-G-C-x-[GA]-[STA]-x(2)-[EG]-x(2)-[CWN]-[LIVM](2).

b) Seven Transmembrane Integral Membrane Proteins. SEQ ID NOS: 24, 41, 101, 157, 291, 305, 315, and 341 correspond to a sequence encoding a polypeptide that is a member of the seven transmembrane receptor family. G-protein coupled receptors (Strosberg, *Eur. J. Biochem.* (1991) 196:1; Kerlavage, *Curr. Opin. Struct. Biol.* (1991) 1:394; and Probst *et al.*, *DNA Cell Biol.* (1992) 11:1; and Savarese *et al.*, *Biochem. J.* (1992) 293:1) (also called R7G) are an extensive group of hormones, neurotransmitters, odorants and light receptors which transduce extracellular signals by interaction with guanine nucleotide-binding (G) proteins. The tertiary structure of these receptors is thought to be highly similar. They have seven hydrophobic regions, each of which most probably spans

the membrane. The N-terminus is located on the extracellular side of the membrane and is often glycosylated, while the C-terminus is cytoplasmic and generally phosphorylated.

Three extracellular loops alternate with three intracellular loops to link the seven transmembrane regions. Most, but not all of these receptors, lack a signal peptide. The most conserved parts of these proteins are the transmembrane regions and the first two cytoplasmic loops. A conserved acidic-Arg-aromatic triplet is present in the N-terminal extremity of the second cytoplasmic loop (Attwood *et al.*, *Gene* (1991) 98:153) and could be implicated in the interaction with G proteins.

To detect this widespread family of proteins a pattern is used that contains the conserved triplet and that also spans the major part of the third transmembrane helix. Additional information about the seven transmembrane receptor family, and methods for their identification and use, is found in U.S. Patent No. 5,759,804. Due in part to their expression on the cell surface and other attractive characteristics, seven transmembrane protein family members are of particular interest as drug targets, as surface antigen markers, and as drug delivery targets (*e.g.*, using antibody-drug complexes and/or use of anti-seven transmembrane protein antibodies as therapeutics in their own right).

c) Ank Repeats. SEQ ID NOS: 116 and 251 represent polynucleotides encoding Ank repeat-containing proteins. The ankyrin motif is a 33 amino acid sequence named after the protein ankyrin which has 24 tandem 33-amino-acid motifs. Ank repeats were originally identified in the cell-cycle-control protein cdc10 (Breedon *et al.*, *Nature* (1987) 329:651). Proteins containing ankyrin repeats include ankyrin, myotropin, I-kappaB proteins, cell cycle protein cdc10, the Notch receptor (Matsuno *et al.*, *Development* (1997) 124(21):4265); G9a (or BAT8) of the class III region of the major histocompatibility complex (Biochem J. 290:811-818, 1993), FABP, GABP, 53BP2, Lin12, glp-1, SW14, and SW16. The functions of the ankyrin repeats are compatible with a role in protein-protein interactions (Bork, *Proteins* (1993) 17(4):363; Lambert and Bennet, *Eur. J. Biochem.* (1993) 211:1; Kerr *et al.*, *Current Op. Cell Biol.* (1992) 4:496; Bennet *et al.*, *J. Biol. Chem.* (1980) 255:6424).

The 90 kD N-terminal domain of ankyrin contains a series of 24 33-amino-acid ank repeats. (Lux *et al.*, *Nature* (1990) 344:36-42, Lambert *et al.*, *PNAS USA* (1990) 87:1730.)

The 24 ank repeats form four folded subdomains of 6 repeats each. These four repeat subdomains mediate interactions with at least 7 different families of membrane proteins. Ankyrin contains two separate binding sites for anion exchanger dimers. One site utilizes repeat subdomain two (repeats 7-12) and the other requires both repeat subdomains 3 and 4 (repeats 13-24). Since the anion exchangers exist in dimers, ankyrin binds 4 anion

exchangers at the same time. (Michaely and Bennett, *J. Biol. Chem.* (1995) 270(37):22050)

The repeat motifs are involved in ankyrin interaction with tubulin, spectrin, and other membrane proteins. (Lux *et al.*, *Nature* (1990) 344:36.)

The Rel/NF-kappaB/Dorsal family of transcription factors have activity that is
5 controlled by sequestration in the cytoplasm in association with inhibitory proteins referred
to as I-kappaB. (Gilmore, *Cell* (1990) 62:841; Nolan and Baltimore, *Curr Opin Genet Dev.*
(1992) 2:211; Baeuerle, *Biochim Biophys Acta* (1991) 1072:63; Schmitz *et al.*, *Trends Cell*
Biol. (1991) 1:130.) I-kappaB proteins contain 5 to 8 copies of 33 amino acid ankyrin
repeats and certain NF-kappaB/rel proteins are also regulated by cis-acting ankyrin repeat
10 containing domains including p105NF-kappaB which contains a series of ankyrin repeats
(Diehl and Hannink, *J. Virol.* (1993) 67(12):7161). The I-kappaBs and Cactus (also
containing ankyrin repeats) inhibit activators through differential interactions with the Rel-
homology domain. The gene family includes proto-oncogenes, thus broadly implicating I-
kappaB in the control of both normal gene expression and the aberrant gene expression that
15 makes cells cancerous. (Nolan and Baltimore, *Curr Opin Genet Dev.* (1992) 2(2):211-220).
In the case of rel/NF-kappaB and pp40/I-kappaB β , both the ankyrin repeats and the carboxy-
terminal domain are required for inhibiting DNA-binding activity and direct association of
pp40/I-kappaB β with rel/NF-kappaB protein. The ankyrin repeats and the carboxy-terminal
of pp40/I-kappaB β (form a structure that associates with the rel homology domain to inhibit
20 DNA binding activity (Inoue *et al.*, *PNAS USA* (1992) 89:4333).

The 4 ankyrin repeats in the amino terminus of the transcription factor subunit
GABP β are required for its interaction with the GABP α subunit to form a functional high
affinity DNA-binding protein. These repeats can be crosslinked to DNA when GABP is
bound to its target sequence. (Thompson *et al.*, *Science* (1991) 253:762; LaMarco *et al.*,
25 *Science* (1991) 253:789).

Myotrophin, a 12.5 kDa protein having a key role in the initiation of cardiac
hypertrophy, comprises ankyrin repeats. The ankyrin repeats are characteristic of a hairpin-
like protruding tip followed by a helix-turn-helix motif. The V-shaped helix-turn-helix of
the repeats stack sequentially in bundles and are stabilized by compact hydrophobic cores,
30 whereas the protruding tips are less ordered.

d) ATPases Associated with Various Cellular Activities (AAA). SEQ ID NOS: 63,
116, 134, 136, 151, 384, and 404 polynucleotides encoding novel members of the "ATPases
Associated with diverse cellular Activities" (AAA) protein family The AAA protein family

is composed of a large number of ATPases that share a conserved region of about 220 amino acids that contains an ATP-binding site (Froehlich *et al.*, *J. Cell Biol.* (1991) 114:443; Erdmann *et al.* *Cell* (1991) 64:499; Peters *et al.*, *EMBO J.* (1990) 9:1757; Kunau *et al.*, *Biochimie* (1993) 75:209-224; Confalonieri *et al.*, *BioEssays* (1995) 17:639;

- 5 <http://yeamob.pci.chemie.uni-tuebingen.de/AAA/Description.html>). The proteins that belong to this family either contain one or two AAA domains.

Proteins containing two AAA domains include: 1) Mammalian and drosophila NSF (N-ethylmaleimide-sensitive fusion protein) and the fungal homolog, SEC18, which are involved in intracellular transport between the endoplasmic reticulum and Golgi, as well as
10 between different Golgi cisternae; 2) Mammalian transitional endoplasmic reticulum ATPase (previously known as p97 or VCP), which is involved in the transfer of membranes from the endoplasmic reticulum to the golgi apparatus. This ATPase forms a ring-shaped homooligomer composed of six subunits. The yeast homolog, CDC48, plays a role in spindle pole proliferation; 3) Yeast protein PAS1 essential for peroxisome assembly and the
15 related protein PAS1 from *Pichia pastoris*; 4) Yeast protein AFG2; 5) *Sulfolobus acidocaldarius* protein SAV and *Halobacterium salinarium* cdcH, which may be part of a transduction pathway connecting light to cell division.

Proteins containing a single AAA domain include: 1) *Escherichia coli* and other bacteria ftsH (or hflB) protein. FtsH is an ATP-dependent zinc metalloprotease that
20 degrades the heat-shock sigma-32 factor, and is an integral membrane protein with a large cytoplasmic C-terminal domain that contain both the AAA and the protease domains; 2) Yeast protein YME1, a protein important for maintaining the integrity of the mitochondrial compartment. YME1 is also a zinc-dependent protease; 3) Yeast protein AFG3 (or YTA10). This protein also contains an AAA domain followed by a zinc-dependent protease domain;
25 4) Subunits from regulatory complex of the 26S proteasome (Hilt *et al.*, *Trends Biochem. Sci.* (1996) 21:96), which is involved in the ATP-dependent degradation of ubiquitinated proteins, which subunits include: a) Mammalian 4 and homologs in other higher eukaryotes, in yeast (gene YTA5) and fission yeast (gene mts2); b) Mammalian 6 (TBP7) and homologs in other higher eukaryotes and in yeast (gene YTA2); c) Mammalian subunit 7 (MSS1) and
30 homologs in other higher eukaryotes and in yeast (gene CIM5 or YTA3); d) Mammalian subunit 8 (P45) and homologs in other higher eukaryotes and in yeast (SUG1 or CIM3 or TBY1) and fission yeast (gene let1); e) Other probable subunits include human TBP1, which influences HIV gene expression by interacting with the virus tat transactivator protein, and yeast YTA1 and YTA6; 5) Yeast protein BCS1, a mitochondrial protein essential for the

expression of the Rieske iron-sulfur protein; 6) Yeast protein MSP1, a protein involved in intramitochondrial sorting of proteins; 7) Yeast protein PAS8, and the corresponding proteins PAS5 from *Pichia pastoris* and PAY4 from *Yarrowia lipolytica*; 8) Mouse protein SKD1 and its fission yeast homolog (SpAC2G11.06); 9) *Caenorhabditis elegans* meiotic spindle formation protein mei-1; 10) Yeast protein SAP1; 11) Yeast protein YTA7; and 12) *Mycobacterium leprae* hypothetical protein A2126A.

In general, the AAA domains in these proteins act as ATP-dependent protein clamps (Confalonieri *et al.* (1995) *BioEssays* 17:639). In addition to the ATP-binding 'A' and 'B' motifs, which are located in the N-terminal half of this domain, there is a highly conserved region located in the central part of the domain which was used in the development of the signature pattern. The consensus pattern is: [LIVMT]-x-[LIVMT]-[LIVMF]-x-[GATMC]-[ST]-[NS]-x(4)-[LIVM]-D-x-A-[LIFA]-x-R.

e) Basic Region Plus Leucine Zipper Transcription Factors. SEQ ID NO:374 correspond to a polynucleotide encoding a novel member of the family of basic region plus leucine zipper transcription factors. The bZIP superfamily (Hurst, *Protein Prof.* (1995) 2:105; and Ellenberger, *Curr. Opin. Struct. Biol.* (1994) 4:12) of eukaryotic DNA-binding transcription factors encompasses proteins that contain a basic region mediating sequence-specific DNA-binding followed by a leucine zipper required for dimerization. Members of the family include transcription factor AP-1, which binds selectively to enhancer elements in the cis control regions of SV40 and metallothionein IIA. AP-1, also known as c-jun, is the cellular homolog of the avian sarcoma virus 17 (ASV17) oncogene v-jun.

Other members of this protein family include jun-B and jun-D, probable transcription factors that are highly similar to jun/AP-1; the fos protein, a proto-oncogene that forms a non-covalent dimer with c-jun; the fos-related proteins fra-1, and fos B; and mammalian cAMP response element (CRE) binding proteins CREB, CREM, ATF-1, ATF-3, ATF-4, ATF-5, ATF-6 and LRF-1. The consensus pattern for this protein family is: [KR]-x(1,3)-[RKSAQ]-N-x(2)-[SAQ](2)-x-[RKTAENQ]-x-R-x-[RK].

f) Bromodomain. SEQ ID NO:97 corresponds to a polynucleotide encoding a polypeptide having a bromodomain region (Haynes *et al.*, 1992, *Nucleic Acids Res.* 20:2693-2603, Tamkun *et al.*, 1992, *Cell* 68:561-572, and Tamkun, 1995, *Curr. Opin. Genet. Dev.* 5:473-477), which is a conserved region of about 70 amino acids found in the following proteins: 1) Higher eukaryotes transcription initiation factor TFIID 250 Kd subunit (TBP-associated factor p250) (gene CCG1); P250 is associated with the TFIID TATA-box binding protein and seems essential for progression of the G1 phase of the cell

cycle. 2) Human RING3, a protein of unknown function encoded in the MHC class II locus;
 3) Mammalian CREB-binding protein (CBP), which mediates cAMP-gene regulation by
 binding specifically to phosphorylated CREB protein; 4) Mammalian homologs of brahma,
 including three brahma-like human: SNF2a(hBRM), SNF2b, and BRG1; 5) Human BS69,
 5 a protein that binds to adenovirus E1A and inhibits E1A transactivation; 6) Human peregrin
 (or Br140).

The bromodomain is thought to be involved in protein-protein interactions and may
 be important for the assembly or activity of multicomponent complexes involved in
 transcriptional activation. The consensus pattern, which spans a major part of the
 10 bromodomain, is: [STANVF]-x(2)-F-x(4)-[DNS]-x(5,7)-[DENQTF]-Y-[HFY]-x(2)-
 [LIVMFY]-x(3)-[LIVM]-x(4)-[LIVM]-x(6,8)-Y-x(12,13)-[LIVM]-x(2)-N-[SACF]-x(2)-
 [FY].

g) EF-Hand. SEQ ID NOS:136, 242, and 379 correspond to polynucleotides
 encoding a novel protein in the family of EF-hand proteins. Many calcium-binding proteins
 15 belong to the same evolutionary family and share a type of calcium-binding domain known
 as the EF-hand (Kawasaki *et al.*, *Protein. Prof.* (1995) 2:305-490). This type of domain
 consists of a twelve residue loop flanked on both sides by a twelve residue alpha-helical
 domain. In an EF-hand loop the calcium ion is coordinated in a pentagonal bipyramidal
 configuration. The six residues involved in the binding are in positions 1, 3, 5, 7, 9 and 12;
 20 these residues are denoted by X, Y, Z, -Y, -X and -Z. The invariant Glu or Asp at position
 12 provides two oxygens for liganding Ca (bidentate ligand).

Proteins known to contain EF-hand regions include: Calmodulin (Ca=4, except in
 yeast where Ca=3) ("Ca=" indicates approximate number of EF-hand regions);
 diacylglycerol kinase (EC 2.7.1.107) (DGK) (Ca=2); 2) FAD-dependent glycerol-3-
 25 phosphate dehydrogenase (EC 1.1.99.5) from mammals (Ca=1); guanylate cyclase activating
 protein (GCAP) (Ca=3); MIF related proteins 8 (MRP-8 or CFAG) and 14 (MRP-14)
 (Ca=2); myosin regulatory light chains (Ca=1); oncomodulin (Ca=2); osteonectin (basement
 membrane protein BM-40) (SPARC); and proteins that contain an "osteonectin" domain
 (QR1, matrix glycoprotein SC1).

30 The consensus pattern includes the complete EF-hand loop as well as the first residue
 which follows the loop and which seem to always be hydrophobic.

Consensus pattern: D-x-[DNS]-{ILVFYW}-[DENSTG]-[DNQGHRK]-{GP}-
 [LIVMC]-[DENQSTAGC]-x(2)-[DE]-[LIVMFYW]

h) Eukaryotic Aspartyl Proteases. SEQ ID NO:308 corresponds to a gene encoding a novel eukaryotic aspartyl protease. Aspartyl proteases, known as acid proteases, (EC 3.4.23.-) are a widely distributed family of proteolytic enzymes (Foltmann B., *Essays Biochem.* (1981) 17:52; Davies D.R., *Annu. Rev. Biophys. Chem.* (1990) 19:189; Rao J.K.M., *et al.*, *Biochemistry* (1991) 30:4663) known to exist in vertebrates, fungi, plants, retroviruses and some plant viruses. Aspartate proteases of eukaryotes are monomeric enzymes which consist of two domains. Each domain contains an active site centered on a catalytic aspartyl residue. The two domains most probably evolved from the duplication of an ancestral gene encoding a primordial domain. Currently known eukaryotic aspartyl proteases include: 1) Vertebrate gastric pepsins A and C (also known as gastricsin); 2) Vertebrate chymosin (rennin), involved in digestion and used for making cheese; 3) Vertebrate lysosomal cathepsins D (EC 3.4.23.5) and E (EC 3.4.23.34); 4) Mammalian renin (EC 3.4.23.15) whose function is to generate angiotensin I from angiotensinogen in the plasma; 5) Fungal proteases such as aspergillopepsin A (EC 3.4.23.18), candidapepsin (EC 3.4.23.24), mucoropepsin (EC 3.4.23.23) (mucor rennin), endothiapepsin (EC 3.4.23.22), polyporopepsin (EC 3.4.23.29), and rhizopuspepsin (EC 3.4.23.21); and 6) Yeast saccharopepsin (EC 3.4.23.25) (proteinase A) (gene PEP4). PEP4 is implicated in posttranslational regulation of vacuolar hydrolases; 7) Yeast barrierpepsin (EC 3.4.23.35) (gene BAR1); a protease that cleaves alpha-factor and thus acts as an antagonist of the mating pheromone; and 8) Fission yeast *sxa1* which is involved in degrading or processing the mating pheromones.

Most retroviruses and some plant viruses, such as badnaviruses, encode for an aspartyl protease which is an homodimer of a chain of about 95 to 125 amino acids. In most retroviruses, the protease is encoded as a segment of a polyprotein which is cleaved during the maturation process of the virus. It is generally part of the pol polyprotein and, more rarely, of the gag polyprotein. Because the sequence around the two aspartates of eukaryotic aspartyl proteases and around the single active site of the viral proteases is conserved, a single signature pattern can be used to identify members of both groups of proteases. The consensus pattern is: [LIVMFGAC]-[LIVMTADN]-[LIVFSA]-D-[ST]-G-[STAV]-[STAPDENQ]-x-[LIVMFSTNC]-x-[LIVMFGTA], where D is the active site residue.

i) GATA Family of Transcription Factors. SEQ ID NO:213 corresponds to a novel member of the GATA family of transcription factors. The GATA family of transcription factors are proteins that bind to DNA sites with the consensus sequence (A/T)GATA(A/G), found within the regulatory region of a number of genes. Proteins currently known to belong

to this family are: 1) GATA-1 (Trainor, C.D., *et al.*, *Nature* (1990) 343:92) (also known as Eryf1, GF-1 or NF-E1), which binds to the GATA region of globin genes and other genes expressed in erythroid cells. It is a transcriptional activator which probably serves as a general 'switch' factor for erythroid development; 2) GATA-2 (Lee, M.E., *et al.*, *J. Biol. Chem.* (1991) 266:16188), a transcriptional activator which regulates endothelin-1 gene expression in endothelial cells; 3) GATA-3 (Ho, I.-C., *et al.*, *EMBO J.* (1991) 10:1187), a transcriptional activator which binds to the enhancer of the T-cell receptor alpha and delta genes; 4) GATA-4 (Spieth, J., *et al.*, *Mol. Cell. Biol.* (1991) 11:4651), a transcriptional activator expressed in endodermally derived tissues and heart; 5) Drosophila protein pannier (or DGATAa) (gene pnr) which acts as a repressor of the achaete-scute complex (as-c); 6) Bombyx mori BCFI (Drevet, J.R., *et al.*, *J. Biol. Chem.* (1994) 269:10660), which regulates the expression of chorion genes; 7) Caenorhabditis elegans elt-1 and elt-2, transcriptional activators of genes containing the GATA region, including vitellogenin genes (Hawkins, M.G., *et al.*, *J. Biol. Chem.* (1995) 270:14666); 8) Ustilago maydis urbs1 (Voisard, C.P.O., *et al.*, *Mol. Cell. Biol.* (1993) 13:7091), a protein involved in the repression of the biosynthesis of siderophores; 9) Fission yeast protein GAF2.

All these transcription factors contain a pair of highly similar 'zinc finger' type domains with the consensus sequence C-x2-C-x17-C-x2-C. Some other proteins contain a single zinc finger motif highly related to those of the GATA transcription factors. These proteins are: 1) Drosophila box A-binding factor (ABF) (also known as protein serpent (gene srp)) which may function as a transcriptional activator protein and may play a key role in the organogenesis of the fat body; 2) Emericella nidulans are (Arst, H.N., Jr., *et al.*, *Trends Genet.* (1989) 5:291) a transcriptional activator which mediates nitrogen metabolite repression; 3) Neurospora crassa nit-2 (Fu, Y.-H., *et al.*, *Mol. Cell. Biol.* (1990) 10:1056), a transcriptional activator which turns on the expression of genes coding for enzymes required for the use of a variety of secondary nitrogen sources, during conditions of nitrogen limitation; 4) Neurospora crassa white collar proteins 1 and 2 (WC-1 and WC-2), which control expression of light-regulated genes; 5) Saccharomyces cerevisiae DAL81 (or UGA43), a negative nitrogen regulatory protein; 6) Saccharomyces cerevisiae GLN3, a positive nitrogen regulatory protein; 7) Saccharomyces cerevisiae GAT1; 8) Saccharomyces cerevisiae GZF3.

The consensus pattern for the GATA family is: C-x-[DN]-C-x(4,5)-[ST]-x(2)-W-[HR]-[RK]-x(3)-[GN]-x(3,4)-C-N-[AS]-C, where the four C's are zinc ligands.

j) G-Protein Alpha Subunit. SEQ ID NO:367 corresponds to a gene encoding a novel polypeptide of the G-protein alpha subunit family. Guanine nucleotide binding proteins (G-proteins) are a family of membrane-associated proteins that couple extracellularly-activated integral-membrane receptors to intracellular effectors, such as ion channels and enzymes that vary the concentration of second messenger molecules. G-proteins are composed of 3 subunits (alpha, beta and gamma) which, in the resting state, associate as a trimer at the inner face of the plasma membrane. The alpha subunit has a molecule of guanosine diphosphate (GDP) bound to it. Stimulation of the G-protein by an activated receptor leads to its exchange for GTP (guanosine triphosphate). This results in the separation of the alpha from the beta and gamma subunits, which always remain tightly associated as a dimer. Both the alpha and beta-gamma subunits are then able to interact with effectors, either individually or in a cooperative manner. The intrinsic GTPase activity of the alpha subunit hydrolyses the bound GTP to GDP. This returns the alpha subunit to its inactive conformation and allows it to reassociate with the beta-gamma subunit, thus restoring the system to its resting state.

G-protein alpha subunits are 350-400 amino acids in length and have molecular weights in the range 40-45 kDa. Seventeen distinct types of alpha subunit have been identified in mammals. These fall into 4 main groups on the basis of both sequence similarity and function: alpha-s, alpha-q, alpha-i and alpha-12 (Simon *et al.*, *Science* (1993) 252:802). Many alpha subunits are substrates for ADP-ribosylation by cholera or pertussis toxins. They are often N-terminally acylated, usually with myristate and/or palmitoylate, and these fatty acid modifications are probably important for membrane association and high-affinity interactions with other proteins. The atomic structure of the alpha subunit of the G-protein involved in mammalian vision, transducin, has been elucidated in both GTP- and GDB-bound forms, and shows considerable similarity in both primary and tertiary structure in the nucleotide-binding regions to other guanine nucleotide binding proteins, such as p21-ras and EF-Tu.

k) Phorbol Esters/Diacylglycerol Binding. SEQ ID NO:188 and 251 represent polynucleotides encoding a protein belonging to the family including phorbol esters/diacylglycerol binding proteins. Diacylglycerol (DAG) is an important second messenger. Phorbol esters (PE) are analogues of DAG and potent tumor promoters that cause a variety of physiological changes when administered to both cells and tissues. DAG activates a family of serine/threonine protein kinases, collectively known as protein kinase C (PKC) (Azzi *et al.*, *Eur. J. Biochem.* (1992) 208:547). Phorbol esters can directly stimulate PKC. The N-terminal region of PKC, known as C1, has been shown (Ono *et al.*, *Proc. Natl.*

Acad. Sci. USA (1989) 86:4868) to bind PE and DAG in a phospholipid and zinc-dependent fashion. The C1 region contains one or two copies (depending on the isozyme of PKC) of a cysteine-rich domain about 50 amino-acid residues long and essential for DAG/PE-binding. Such a domain has also been found in, for example, the following proteins.

5 (1) Diacylglycerol kinase (EC 2.7.1.107) (DGK) (Sakane *et al.*, *Nature* (1990) 344:345), the enzyme that converts DAG into phosphatidate. It contains two copies of the DAG/PE-binding domain in its N-terminal section. At least five different forms of DGK are known in mammals; and

(2) N-chimaerin, a brain specific protein which shows sequence similarities with the
10 BCR protein at its C-terminal part and contains a single copy of the DAG/PE-binding domain at its N-terminal part. It has been shown (Ahmed *et al.*, *Biochem. J.* (1990) 272:767, and Ahmed *et al.*, *Biochem. J.* (1991) 280:233) to be able to bind phorbol esters.

The DAG/PE-binding domain binds two zinc ions; the ligands of these metal ions are probably the six cysteines and two histidines that are conserved in this domain. The
15 signature pattern completely spans the DAG/PE domain. The consensus pattern is: H-x-[LIVMFYW]-x(8,11)-C-x(2)-C-x(3)-[LIVMFC]-x(5,10)-C-x(2)-C-x(4)-[HD]-x(2)-C-x(5,9)-C. All the C and H are probably involved in binding zinc.

1) Protein Kinase. SEQ ID NOS:202, 315, 367, and 397 represent polynucleotides encoding protein kinases. Protein kinases catalyze phosphorylation of proteins in a variety of
20 pathways, and are implicated in cancer. Eukaryotic protein kinases (Hanks S.K., *et al.*, *FASEB J.* (1995) 9:576; Hunter T., *Meth. Enzymol.* (1991) 200:3; Hanks S.K., *et al.*, *Meth. Enzymol.* (1991) 200:38; Hanks S.K., *Curr. Opin. Struct. Biol.* (1991) 1:369; Hanks S.K., *et al.*, *Science* (1988) 241:42) are enzymes that belong to a very extensive family of proteins which share a conserved catalytic core common to both serine/threonine and tyrosine protein
25 kinases. There are a number of conserved regions in the catalytic domain of protein kinases. Two of the conserved regions are the basis for the signature pattern in the protein kinase profile. The first region, which is located in the N-terminal extremity of the catalytic domain, is a glycine-rich stretch of residues in the vicinity of a lysine residue, which has been shown to be involved in ATP binding. The second region, which is located in the
30 central part of the catalytic domain, contains a conserved aspartic acid residue which is important for the catalytic activity of the enzyme (Knighton D.R., *et al.*, *Science* (1991) 253:407). The protein kinase profile includes two signature patterns for this second region: one specific for serine/threonine kinases and the other for tyrosine kinases. A third profile is

based on the alignment in (Hanks S.K., *et al.*, *FASEB J.* (1995) 9:576) and covers the entire catalytic domain. The consensus patterns are as follows:

1) Consensus pattern: [LIV]-G-{P}-G-{P}-[FYWMGSTNH]-[SGA]-{PW}-[LIVCAT]-{PD}-x-[GSTACLIVMFY]-x(5,18)-[LIVMFYWCSTAR]-[AIVP]-

5 [LIVMFAGCKR]-K, where K binds ATP. The majority of known protein kinases are detected by this pattern. Proteins kinases that are not detected by this consensus include viral kinases, which are quite divergent in this region and are completely missed by this pattern.

2) Consensus pattern: [LIVMFYC]-x-[HY]-x-D-[LIVMFY]-K-x(2)-N-[LIVMFYCT](3), where D is an active site residue. This consensus sequence identifies most serine/threonine-specific protein kinases with only 10 exceptions. Half of the exceptions are viral kinases, while the other exceptions include Epstein-Barr virus BGLF4 and Drosophila ninaC, which have Ser and Arg, respectively, instead of the conserved Lys. These latter two protein kinases are detected by the tyrosine kinase specific pattern described below.

15 3) Consensus pattern: [LIVMFYC]-x-[HY]-x-D-[LIVMFY]-[RSTAC]-x(2)-N-[LIVMFYC], where D is an active site residue. All tyrosine-specific protein kinases are detected by this consensus pattern, with the exception of human ERBB3 and mouse blk. This pattern also detects most bacterial aminoglycoside phosphotransferases (Benner S., *Nature* (1987) 329:21; Kirby R., *J. Mol. Evol.* (1992) 30:489) and herpesviruses ganciclovir
20 kinases (Littler E., *et al.*, *Nature* (1992) 358:160), which are structurally and evolutionary related to protein kinases.

The protein kinase profile also detects receptor guanylate cyclases and 2-5A-dependent ribonucleases. Sequence similarities between these two families and the eukaryotic protein kinase family have been noticed previously. The profile also detects
25 *Arabidopsis thaliana* kinase-like protein TMKL1 which seems to have lost its catalytic activity.

If a protein analyzed includes the two of the above protein kinase signatures, the probability of it being a protein kinase is close to 100%. Eukaryotic-type protein kinases have also been found in prokaryotes such as *Myxococcus xanthus* (Munoz-Dorado J., *et al.*,
30 *Cell* (1991) 67:995) and *Yersinia pseudotuberculosis*. The patterns shown above has been updated since their publication in (Bairoch A., *et al.*, *Nature* (1988) 331:22).

m) Protein Phosphatase 2C. SEQ ID NO:256 corresponds to a polynucleotide encoding a novel protein phosphatase 2C (PP2C), which is one of the four major classes of mammalian serine/threonine specific protein phosphatases. PP2C (Wenk *et al.*, *FEBS Lett.*

(1992) 297:135) is a monomeric enzyme of about 42 Kd which shows broad substrate specificity and is dependent on divalent cations (mainly manganese and magnesium) for its activity. Three isozymes are currently known in mammals: PP2C-alpha, -beta and -gamma.

n) Protein Tyrosine Phosphatase. SEQ ID NO:382 represents a polynucleotide
5 encoding a protein tyrosine kinase. Tyrosine specific protein phosphatases (EC 3.1.3.48) (PTPase) (Fischer *et al.*, *Science* (1991) 253:401; Charbonneau *et al.*, *Annu. Rev. Cell Biol.* (1992) 8:463; Trowbridge, *J. Biol. Chem.* (1991) 266:23517; Tonks *et al.*, *Trends Biochem. Sci.* (1989) 14:497; and Hunter, *Cell* (1989) 58:1013) catalyze the removal of a phosphate group attached to a tyrosine residue. These enzymes are very important in the control of cell
10 growth, proliferation, differentiation and transformation. Multiple forms of PTPase have been characterized and can be classified into two categories: soluble PTPases and transmembrane receptor proteins that contain PTPase domain(s).

Soluble PTPases include PTPN3 (H1) and PTPN4 (MEG), enzymes that contain an N-terminal band 4.1-like domain and could act at junctions between the membrane and
15 cytoskeleton; PTPN6 (PTP-1C; HCP; SHP) and PTPN11 (PTP-2C; SH-PTP3; Syp), enzymes that contain two copies of the SH2 domain at its N-terminal extremity.

Dual specificity PTPases include DUSP1 (PTPN10; MAP kinase phosphatase-1; MKP-1) which dephosphorylates MAP kinase on both Thr-183 and Tyr-185; and DUSP2 (PAC-1), a nuclear enzyme that dephosphorylates MAP kinases ERK1 and ERK2 on both
20 Thr and Tyr residues.

Structurally, all known receptor PTPases are made up of a variable length extracellular domain, followed by a transmembrane region and a C-terminal catalytic cytoplasmic domain. Some of the receptor PTPases contain fibronectin type III (FN-III) repeats, immunoglobulin-like domains, MAM domains or carbonic anhydrase-like domains
25 in their extracellular region. The cytoplasmic region generally contains two copies of the PTPase domain. The first seems to have enzymatic activity, while the second is inactive but seems to affect substrate specificity of the first. In these domains, the catalytic cysteine is generally conserved but some other, presumably important, residues are not.

PTPase domains consist of about 300 amino acids. There are two conserved
30 cysteines and the second one has been shown to be absolutely required for activity. Furthermore, a number of conserved residues in its immediate vicinity have also been shown to be important. The consensus pattern for PTPases is: [LIVMF]-H-C-x(2)-G-x(3)-[STC]-[STAGP]-x-[LIVMFY]; C is the active site residue.

o) SH3 Domain. SEQ ID NO:306 and 386 represent polynucleotides encoding SH3 domain proteins. The Src homology 3 (SH3) domain is a small protein domain of about 60 amino acid residues first identified as a conserved sequence in the non-catalytic part of several cytoplasmic protein tyrosine kinases (e.g. Src, Abl, Lck) (Mayer *et al.*, *Nature* (1988) 332:272). The domain has also been found in a variety of intracellular or membrane-associated proteins (Musacchio *et al.*, *FEBS Lett.* (1992) 307:55; Pawson *et al.*, *Curr. Biol.* (1993) 3:434; Mayer *et al.*, *Trends Cell Biol.* (1993) 3:8; and Pawson *et al.*, *Nature* (1995) 373:573).

The SH3 domain has a characteristic fold that consists of five or six beta-strands arranged as two tightly packed anti-parallel beta sheets. The linker regions may contain short helices (Kuriyan *et al.*, *Curr. Opin. Struct. Biol.* (1993) 3:828). It is believed that SH3 domain-containing proteins mediate assembly of specific protein complexes via binding to proline-rich peptides (Morton *et al.*, *Curr. Biol.* (1994) 4:615). In general, SH3 domains are found as single copies in a given protein, but there is a significant number of proteins with two SH3 domains and a few with 3 or 4 copies.

SH3 domains have been identified in, for example, protein tyrosine kinases, such as the Src, Abl, Bkt, Csk and ZAP70 families of kinases; mammalian phosphatidylinositol-specific phospholipase C-gamma-1 and -2; mammalian phosphatidyl inositol 3-kinase regulatory p85 subunit; mammalian Ras GTPase-activating protein (GAP); mammalian Vav oncoprotein, a guanine nucleotide exchange factor of the CDC24 family; *Drosophila* lethal(1)discs large-1 tumor suppressor protein (gene Dlg1); mammalian tight junction protein ZO-1; vertebrate erythrocyte membrane protein p55; *Caenorhabditis elegans* protein lin-2; rat protein CASK; and mammalian synaptic proteins SAP90/PSD-95, CHAPSYN-110/PSD-93, SAP97/DLG1 and SAP102. Novel SH3-domain containing polypeptides will facilitate elucidation of the role of such proteins in important biological pathways, such as ras activation.

p) Trypsin. SEQ ID NO:169 corresponds to a novel serine protease of the trypsin family. The catalytic activity of the serine proteases from the trypsin family is provided by a charge relay system involving an aspartic acid residue hydrogen-bonded to a histidine, which itself is hydrogen-bonded to a serine. The sequences in the vicinity of the active site serine and histidine residues are well conserved in this family of proteases (Brenner S., *Nature* (1988) 334:528). Proteases known to belong to the trypsin family include: 1) Acrosin; 2) Blood coagulation factors VII, IX, X, XI and XII, thrombin, plasminogen, and protein C; 3) Cathepsin G; 4) Chymotrypsins; 5) Complement components C1r, C1s, C2, and complement

factors B, D and I; 6) Complement-activating component of RA-reactive factor; 7) Cytotoxic cell proteases (granzymes A to H); 8) Duodenase I; 9) Elastases 1, 2, 3A, 3B (protease E), leukocyte (medullasin); 10) Enterokinase (EC 3.4.21.9) (enteropeptidase); 11) Hepatocyte growth factor activator; 12) Hepsin; 13) Glandular (tissue) kallikreins (including EGF-binding protein types A, B, and C, NGF-gamma chain, gamma-renin, prostate specific antigen (PSA) and tonin); 14) Plasma kallikrein; 15) Mast cell proteases (MCP) 1 (chymase) to 8; 16) Myeloblastin (proteinase 3) (Wegener's autoantigen); 17) Plasminogen activators (urokinase-type, and tissue-type); 18) Trypsins I, II, III, and IV; 19) Trypsins; 20) Snake venom proteases such as ancrod, batroxobin, cerastobin, flavoxobin, and protein C activator; 21) Collagenase from common cattle grub and collagenolytic protease from Atlantic sand fiddler crab; 22) Apolipoprotein(a); 23) Blood fluke cercarial protease; 24) Drosophila trypsin like proteases: alpha, easter, snake-locus; 25) Drosophila protease stubble (gene sb); and 26) Major mite fecal allergen Der p III. All the above proteins belong to family S1 in the classification of peptidases (Rawlings N.D., *et al.*, *Meth. Enzymol.* (1994) 244:19; <http://www.expasy.ch/cgi-bin/lists?peptidas.txt>) and originate from eukaryotic species. It should be noted that bacterial proteases that belong to family S2A are similar enough in the regions of the active site residues that they can be picked up by the same patterns.

The consensus patterns for this trypsin protein family are: 1) [LIVM]-[ST]-A-[STAG]-H-C, where H is the active site residue. All sequences known to belong to this class detected by the pattern, except for complement components C1r and C1s, pig plasminogen, bovine protein C, rodent urokinase, ancrod, gyroxin and two insect trypsins; 2) [DNSTAGC]-[GSTAPIMVQH]-x(2)-G-[DE]-S-G-[GS]-[SAPHV]-[LIVMFYWH]-[LIVMFYSTANQH], where S is the active site residue. All sequences known to belong to this family are detected by the above consensus sequences, except for 18 different proteases which have lost the first conserved glycine. If a protein includes both the serine and the histidine active site signatures, the probability of it being a trypsin family serine protease is 100%.

q) WD Domain, G-Beta Repeats. SEQ ID NOS:188 and 335 represent novel members of the WD domain/G-beta repeat family. Beta-transducin (G-beta) is one of the three subunits (alpha, beta, and gamma) of the guanine nucleotide-binding proteins (G proteins) which act as intermediaries in the transduction of signals generated by transmembrane receptors (Gilman, *Annu. Rev. Biochem.* (1987) 56:615). The alpha subunit binds to and hydrolyzes GTP; the functions of the beta and gamma subunits are less clear but

they seem to be required for the replacement of GDP by GTP as well as for membrane anchoring and receptor recognition.

In higher eukaryotes, G-beta exists as a small multigene family of highly conserved proteins of about 340 amino acid residues. Structurally, G-beta consists of eight tandem repeats of about 40 residues, each containing a central Trp-Asp motif (this type of repeat is sometimes called a WD-40 repeat). Such a repetitive segment has been shown to exist in a number of other proteins including: human LIS1, a neuronal protein involved in type-1 lissencephaly; and mammalian coatamer beta' subunit (beta'-COP), a component of a cytosolic protein complex that reversibly associates with Golgi membranes to form vesicles that mediate biosynthetic protein transport.

The consensus pattern for the WD domain/G-Beta repeat family is: [LIVMSTAC]-[LIVMFYWSTAGC]-[LIMSTAG]-[LIVMSTAGC]-x(2)-[DN]-x(2)-[LIVMWSTAC]-x-[LIVMFSTAG]-W-[DEN]-[LIVMFSTAGCN].

r) wnt Family of Developmental Signaling Proteins. SEQ ID NO: 23, 291, 324, 330, 341, and 353 correspond to novel members of the wnt family of developmental signaling proteins. Wnt-1 (previously known as int-1), the seminal member of this family, (Nusse R., *Trends Genet.* (1988) 4:291) is a proto-oncogene induced by the integration of the mouse mammary tumor virus. It is thought to play a role in intercellular communication and seems to be a signalling molecule important in the development of the central nervous system (CNS). The sequence of wnt-1 is highly conserved in mammals, fish, and amphibians. Wnt-1 was found to be a member of a large family of related proteins (Nusse R., *et al.*, *Cell* (1992) 69:1073; McMahon A.P., *Trends Genet.* (1992) 8:1; Moon R.T., *BioEssays* (1993) 15:91) that are all thought to be developmental regulators. These proteins are known as wnt-2 (also known as irp), wnt-3, -3A, -4, -5A, -5B, -6, -7A, -7B, -8, -8B, -9 and -10. At least four members of this family are present in *Drosophila*; one of them, wingless (wg), is implicated in segmentation polarity. All these proteins share the following features characteristics of secretory proteins: a signal peptide, several potential N-glycosylation sites and 22 conserved cysteines that are probably involved in disulfide bonds. The Wnt proteins seem to adhere to the plasma membrane of the secreting cells and are therefore likely to signal over only few cell diameters. The consensus pattern, which is based upon a highly conserved region including three cysteines, is as follows: C-K-C-H-G-[LIVMT]-S-G-x-C. All sequences known to belong to this family are detected by the provided consensus pattern.

s) Ww/rsp5/WWP Domain-Containing Proteins. SEQ ID NOS:188, 379, and 395 represent polynucleotides encoding a polypeptide in the family of WW/rsp5/WWP domain-

containing proteins. The WW domain (Bork *et al.*, *Trends Biochem. Sci.* (1994) 19:531; Andre *et al.*, *Biochem. Biophys. Res. Commun.* (1994) 205:1201; Hofmann *et al.*, *FEBS Lett.* (1995) 358:153; and Sudol *et al.*, *FEBS Lett.* (1995) 369:67), also known as rsp5 or WWP), was originally discovered as a short conserved region in a number of unrelated proteins, among them dystrophin, the gene responsible for Duchenne muscular dystrophy. The domain, which spans about 35 residues, is repeated up to 4 times in some proteins. It has been shown (Chen *et al.*, *Proc. Natl. Acad. Sci. USA* (1995) 92:7819) to bind proteins with particular proline-motifs, [AP]-P-P-[AP]-Y, and thus resembles somewhat SH3 domains. It appears to contain beta-strands grouped around four conserved aromatic positions, generally Trp. The name WW or WWP derives from the presence of these Trp as well as that of a conserved Pro. It is frequently associated with other domains typical for proteins in signal transduction processes.

Proteins containing the WW domain include:

1. Dystrophin, a multidomain cytoskeletal protein. Its longest alternatively spliced form consists of an N-terminal actin-binding domain, followed by 24 spectrin-like repeats, a cysteine-rich calcium-binding domain and a C-terminal globular domain. Dystrophins form tetramers and is thought to have multiple functions including involvement in membrane stability, transduction of contractile forces to the extracellular environment and organization of membrane specialization. Mutations in the dystrophin gene lead to muscular dystrophy of Duchenne or Becker type. Dystrophin contains one WW domain C-terminal of the spectrin-repeats.

2. Vertebrate YAP protein, which is a substrate of an unknown serine kinase. It binds to the SH3 domain of the Yes oncoprotein via a proline-rich region. This protein appears in alternatively spliced isoforms, containing either one or two WW domains.

3. IQGAP, which is a human GTPase activating protein acting on ras. It contains an N-terminal domain similar to fly muscle mp20 protein and a C-terminal ras GTPase activator domain.

For the sensitive detection of WW domains, the profile spans the whole homology region as well as a pattern. The consensus for this family is: W-x(9,11)-[VFY]-[FYW]-x(6,7)-[GSTNE]-[GSTQCR]-[FYW]-x(2)-P.

t) Zinc Finger, C2H2 Type. SEQ ID NO:61, 306, and 386 correspond to polynucleotides encoding novel members of the of the C2H2 type zinc finger protein family. Zinc finger domains (Klug *et al.*, *Trends Biochem. Sci.* (1987) 12:464; Evans *et al.*, *Cell* (1988) 52:1; Payre *et al.*, *FEBS Lett.* (1988) 234:245; Miller *et al.*, *EMBO J.* (1985) 4:1609;

and Berg, *Proc. Natl. Acad. Sci. USA* (1988) 85:99) are nucleic acid-binding protein structures first identified in the *Xenopus* transcription factor TFIIIA. These domains have since been found in numerous nucleic acid-binding proteins. A zinc finger domain is composed of 25 to 30 amino acid residues. Two cysteine or histidine residues are positioned at both extremities of the domain, which are involved in the tetrahedral coordination of a zinc atom. It has been proposed that such a domain interacts with about five nucleotides.

Many classes of zinc fingers are characterized according to the number and positions of the histidine and cysteine residues involved in the zinc atom coordination. In the first class to be characterized, called C2H2, the first pair of zinc coordinating residues are cysteines, while the second pair are histidines. A number of experimental reports have demonstrated the zinc-dependent DNA or RNA binding property of some members of this class.

Mammalian proteins having a C2H2 zipper include (number in parenthesis indicates number of zinc finger regions in the protein): basoonuclin (6), BCL-6/LAZ-3 (6), erythroid krueppel-like transcription factor (3), transcription factors Sp1 (3), Sp2 (3), Sp3 (3) and Sp4 (3), transcriptional repressor YY1 (4), Wilms' tumor protein (4), EGR1/Krox24 (3), EGR2/Krox20 (3), EGR3/Pilot (3), EGR4/AT133 (4), Evi-1 (10), GLI1 (5), GLI2 (4+), GLI3 (3+), HIV-EP1/ZNF40 (4), HIV-EP2 (2), KR1 (9+), KR2 (9), KR3 (15+), KR4 (14+), KR5 (11+), HF.12 (6+), REX-1 (4), Zfx (13), Zfy (13), Zfp-35 (18), ZNF7 (15), ZNF8 (7), ZNF35 (10), ZNF42/MZF-1 (13), ZNF43 (22), ZNF46/Kup (2), ZNF76 (7), ZNF91 (36), ZNF133 (3).

In addition to the conserved zinc ligand residues, it has been shown that a number of other positions are also important for the structural integrity of the C2H2 zinc fingers. (Rosenfeld *et al.*, *J. Biomol. Struct. Dyn.* (1993) 11:557) The best conserved position is found four residues after the second cysteine; it is generally an aromatic or aliphatic residue.

The consensus pattern for C2H2 zinc fingers is: C-x(2,4)-C-x(3)-[LIVMFYWC]-x(8)-H-x(3,5)-H. The two C's and two H's are zinc ligands.

u) Zinc Finger, CCHC Class. SEQ ID NO:322 corresponds to a polynucleotide encoding a novel member of the zinc finger CCHC family. The CCHC zinc finger protein family to date has been mostly composed of retroviral gag proteins (nucleocapsid). The prototype structure of this family is from HIV. The family also contains members involved in eukaryotic gene regulation, such as *C. elegans* GLH-1. The consensus sequence of this family is based upon the common structure of an 18-residue zinc finger.

v) Zinc-Binding Metalloprotease Domain. SEQ ID NO:306 and 395 represent polynucleotides encoding novel members of the zinc-binding metalloprotease domain protein family. The majority of zinc-dependent metalloproteases (with the notable exception of the carboxypeptidases) share a common pattern of primary structure (Jongeneel *et al.*, *FEBS Lett.* (1989) 242:211; Murphy *et al.*, *FEBS Lett.* (1991) 289:4; and Bode *et al.*, *Zoology* (1996) 99:237) in the part of their sequence involved in the binding of zinc, and can be grouped together as a superfamily, known as the metzincins, on the basis of this sequence similarity. Examples of these proteins include: 1) Angiotensin-converting enzyme (EC 3.4.15.1) (dipeptidyl carboxypeptidase I) (ACE), the enzyme responsible for hydrolyzing angiotensin I to angiotensin II. 2) Mammalian extracellular matrix metalloproteinases (known as matrixins) (Woessner, *FASEB J.* (1991) 5:2145): MMP-1 (EC 3.4.24.7) (interstitial collagenase), MMP-2 (EC 3.4.24.24) (72 Kd gelatinase), MMP-9 (EC 3.4.24.35) (92 Kd gelatinase), MMP-7 (EC 3.4.24.23) (matrylisin), MMP-8 (EC 3.4.24.34) (neutrophil collagenase), MMP-3 (EC 3.4.24.17) (stromelysin-1), MMP-10 (EC 3.4.24.22) (stromelysin-2), and MMP-11 (stromelysin-3), MMP-12 (EC 3.4.24.65) (macrophage metalloelastase). 3) Endothelin-converting enzyme 1 (EC 3.4.24.71) (ECE-1), which processes the precursor of endothelin to release the active peptide.

A signature pattern which includes the two histidine and the glutamic acid residues is sufficient to detect this superfamily of proteins, having the consensus pattern: [GSTALIVN]-x(2)-H-E-[LIVMFYW]-{DEHRKP}-H-x-[LIVMFYWGSPQ]. The two H's are zinc ligands, and E is the active site residue.

Example 4: Differential Expression of Polynucleotides of the Invention : Description of Libraries and Detection of Differential Expression

The relative expression levels of the polynucleotides of the invention was assessed in several libraries prepared from various sources, including cell lines and patient tissue samples. Table 4 provides a summary of these libraries, including the shortened library name (used hereafter), the mRNA source used to prepared the cDNA library, the "nickname" of the library that is used in the tables below (in quotes), and the approximate number of clones in the library.

Table 4 Description of cDNA Libraries

Library (lib #)	Description	Number of Clones in this Clustering
1	Km12 L4 Human Colon Cell Line, High Metastatic Potential (derived from Km12C) "High Colon"	307133
2	Km12C Human Colon Cell Line, Low Metastatic Potential "Low Colon"	284755
3	MDA-MB-231 Human Breast Cancer Cell Line, High Metastatic Potential; micro-metastases in lung "High Breast"	326937
4	MCF7 Human Breast Cancer Cell, Non Metastatic "Low Breast"	318979
8	MV-522 Human Lung Cancer Cell Line, High Metastatic Potential "High Lung"	223620
9	UCP-3 Human Lung Cancer Cell Line, Low Metastatic Potential "Low Lung"	312503
12	Human microvascular endothelial cells (HMEC) – Untreated PCR (OligodT) cDNA library	41938
13	Human microvascular endothelial cells (HMEC) – bFGF treated PCR (OligodT) cDNA library	42100
14	Human microvascular endothelial cells (HMEC) – VEGF treated PCR (OligodT) cDNA library	42825
15	Normal Colon – UC#2 Patient PCR (OligodT) cDNA library "Normal Colon Tumor Tissue"	34285
16	Colon Tumor – UC#2 Patient PCR (OligodT) cDNA library "Normal Colon Tumor Tissue"	35625
17	Liver Metastasis from Colon Tumor of UC#2 Patient PCR (OligodT) cDNA library "High Colon Metastasis Tissue"	36984
18	Normal Colon – UC#3 Patient PCR (OligodT) cDNA library "Normal Colon Tumor Tissue"	36216
19	Colon Tumor – UC#3 Patient PCR (OligodT) cDNA library "High Colon Tumor Tissue"	41388
20	Liver Metastasis from Colon Tumor of UC#3 Patient PCR (OligodT) cDNA library "High Colon Metastasis Tissue"	30956

The KM12L4 and KM12C cell lines are described in Example 1 above. The MDA-MB-231 cell line was originally isolated from pleural effusions (Cailleau, *J. Natl. Cancer. Inst.* (1974) 53:661), is of high metastatic potential, and forms poorly differentiated adenocarcinoma grade II in nude mice consistent with breast carcinoma. The MCF7 cell line was derived from a pleural effusion of a breast adenocarcinoma and is non-metastatic. The MV-522 cell line is derived from a human lung carcinoma and is of high metastatic potential. The UCP-3 cell line is a low metastatic human lung carcinoma cell line; the MV-522 is a high metastatic variant of UCP-3. These cell lines are well-recognized in the art as models for the study of human breast and lung cancer (see, e.g., Chandrasekaran *et al.*, *Cancer Res.* (1979) 39:870 (MDA-MB-231 and MCF-7); Gastpar *et al.*, *J Med Chem* (1998) 41:4965 (MDA-MB-231 and MCF-7); Ranson *et al.*, *Br J Cancer* (1998) 77:1586 (MDA-MB-231 and MCF-7); Kuang *et al.*, *Nucleic Acids Res* (1998) 26:1116 (MDA-MB-231 and MCF-7); Varki *et al.*, *Int J Cancer* (1987) 40:46 (UCP-3); Varki *et al.*, *Tumour Biol.* (1990) 11:327; (MV-522 and UCP-3); Varki *et al.*, *Anticancer Res.* (1990) 10:637; (MV-522); Kelner *et al.*, *Anticancer Res* (1995) 15:867 (MV-522); and Zhang *et al.*, *Anticancer Drugs* (1997) 8:696 (MV522)). The samples of libraries 15-20 are derived from two different patients (UC#2, and UC#3).

Each of the libraries is composed of a collection of cDNA clones that in turn are representative of the mRNAs expressed in the indicated mRNA source. In order to facilitate the analysis of the millions of sequences in each library, the sequences were assigned to clusters. The concept of "cluster of clones" is derived from a sorting/grouping of cDNA clones based on their hybridization pattern to a panel of roughly 300 7bp oligonucleotide probes (see Drmanac *et al.*, *Genomics* (1996) 37(1):29). Random cDNA clones from a tissue library are hybridized at moderate stringency to 300 7bp oligonucleotides. Each oligonucleotide has some measure of specific hybridization to that specific clone. The combination of 300 of these measures of hybridization for 300 probes equals the "hybridization signature" for a specific clone. Clones with similar sequence will have similar hybridization signatures. By developing a sorting/grouping algorithm to analyze these signatures, groups of clones in a library can be identified and brought together computationally. These groups of clones are termed "clusters". Depending on the stringency of the selection in the algorithm (similar to the stringency of hybridization in a classic library cDNA screening protocol), the "purity" of each cluster can be controlled. For example, artifacts of clustering may occur in computational clustering just as artifacts can occur in "wet-lab" screening of a cDNA library with 400 bp cDNA fragments, at even the

highest stringency. The stringency used in the implementation of cluster herein provides groups of clones that are in general from the same cDNA or closely related cDNAs. Closely related clones can be a result of different length clones of the same cDNA, closely related clones from highly related gene families, or splice variants of the same cDNA.

5 Differential expression for a selected cluster was assessed by first determining the number of cDNA clones corresponding to the selected cluster in the first library (Clones in 1st), and the determining the number of cDNA clones corresponding to the selected cluster in the second library (Clones in 2nd). Differential expression of the selected cluster in the first library relative to the second library is expressed as a "ratio" of percent expression between
10 the two libraries. In general, the "ratio" is calculated by: 1) calculating the percent expression of the selected cluster in the first library by dividing the number of clones corresponding to a selected cluster in the first library by the total number of clones analyzed from the first library; 2) calculating the percent expression of the selected cluster in the second library by dividing the number of clones corresponding to a selected cluster in a
15 second library by the total number of clones analyzed from the second library; 3) dividing the calculated percent expression from the first library by the calculated percent expression from the second library. If the "number of clones" corresponding to a selected cluster in a library is zero, the value is set at 1 to aid in calculation. The formula used in calculating the ratio takes into account the "depth" of each of the libraries being compared, *i.e.*, the total
20 number of clones analyzed in each library.

In general, a polynucleotide is said to be significantly differentially expressed between two samples when the ratio value is greater than at least about 2, preferably greater than at least about 3, more preferably greater than at least about 5, where the ratio value is calculated using the method described above. The significance of differential expression is
25 determined using a z score test (Zar, Biostatistical Analysis, Prentice Hall, Inc., USA, "Differences between Proportions," pp 296-298 (1974).

Tables 5 to 7 (inserted before the claims) show the number of clones in each of the above libraries that were analyzed for differential expression. Examples of differentially expressed polynucleotides of particular interest are described in more detail below.

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Example 5: Polynucleotides Differentially Expressed in High Metastatic Potential Breast Cancer Cells Versus Low Metastatic Breast Cancer Cells

A number of polynucleotide sequences have been identified that are differentially expressed between cells derived from high metastatic potential breast cancer tissue and low

metastatic breast cancer cells. Expression of these sequences in breast cancer can be valuable in determining diagnostic, prognostic and/or treatment information. For example, sequences that are highly expressed in the high metastatic potential cells can be indicative of increased expression of genes or regulatory sequences involved in the metastatic process. A
5 patient sample displaying an increased level of one or more of these polynucleotides may thus warrant more aggressive treatment. In another example, sequences that display higher expression in the low metastatic potential cells can be associated with genes or regulatory sequences that inhibit metastasis, and thus the expression of these polynucleotides in a sample may warrant a more positive prognosis than the gross pathology would suggest.

10 The differential expression of these polynucleotides can be used as a diagnostic marker, a prognostic marker, for risk assessment, patient treatment and the like. These polynucleotide sequences can also be used in combination with other known molecular and/or biochemical markers.

The following table summarizes identified polynucleotides with differential
15 expression between high metastatic potential breast cancer cells and low metastatic potential breast cancer cells.

Table 8. Differentially expressed polynucleotides: High metastatic potential breast cancer vs. low metastatic breast cancer cells

SEQ ID NO.	Differential Expression	Cluster ID	Clones in 1 st Library	Clones in 2 nd Library	Ratio
9	High Breast > Low Breast (Lib3 > Lib4)	2623	31	4	7.561356
42	High Breast > Low Breast (Lib3 > Lib4)	307	196	75	2.549721
52	High Breast > Low Breast (Lib3 > Lib4)	19	1364	525	2.534854
62	High Breast > Low Breast (Lib3 > Lib4)	2623	31	4	7.561356
65	High Breast > Low Breast (Lib3 > Lib4)	5749	9	0	8.780930
66	High Breast > Low Breast (Lib3 > Lib4)	6455	6	0	5.853953
68	High Breast > Low Breast (Lib3 > Lib4)	6455	6	0	5.853953
114	High Breast > Low Breast (Lib3 > Lib4)	2030	32	4	7.805271
123	High Breast > Low Breast (Lib3 > Lib4)	3389	13	2	6.341782
144	High Breast > Low Breast (Lib3 > Lib4)	4623	12	2	5.853953
172	High Breast > Low Breast (Lib3 > Lib4)	102	278	116	2.338217
178	High Breast > Low Breast (Lib3 > Lib4)	3681	10	1	9.756589
214	High Breast > Low Breast (Lib3 > Lib4)	3900	8	1	7.805271
219	High Breast > Low Breast (Lib3 > Lib4)	3389	13	2	6.341782
223	High Breast > Low Breast (Lib3 > Lib4)	1399	19	7	2.648217
258	High Breast > Low Breast (Lib3 > Lib4)	4837	10	0	9.756589
317	High Breast > Low Breast (Lib3 > Lib4)	1577	25	3	8.130490
379	High Breast > Low Breast (Lib3 > Lib4)	260	27	2	13.17139
4	Low Breast > High Breast (Lib4 > Lib3)	3706	22	4	5.637215
39	Low Breast > High Breast (Lib4 > Lib3)	4016	6	0	6.149690
74	Low Breast > High Breast (Lib4 > Lib3)	6268	18	3	6.149690
81	Low Breast > High Breast (Lib4 > Lib3)	40392	8	1	8.199586
130	Low Breast > High Breast (Lib4 > Lib3)	13183	7	0	7.174638
157	Low Breast > High Breast (Lib4 > Lib3)	5417	9	0	9.224535
162	Low Breast > High Breast (Lib4 > Lib3)	9685	7	0	7.174638
183	Low Breast > High Breast (Lib4 > Lib3)	7337	16	3	5.466391
202	Low Breast > High Breast (Lib4 > Lib3)	6124	9	1	9.224535
298	Low Breast > High Breast (Lib4 > Lib3)	1037	22	4	5.637215
338	Low Breast > High Breast (Lib4 > Lib3)	689	36	17	2.170478
384	Low Breast > High Breast (Lib4 > Lib3)	697	72	30	2.459876
386	Low Breast > High Breast (Lib4 > Lib3)	4568	9	0	9.224535
388	Low Breast > High Breast (Lib4 > Lib3)	5622	13	2	6.662164

5 Example 6: Polynucleotides Differentially Expressed in High Metastatic Potential Lung Cancer Cells Versus Low Metastatic Lung Cancer Cells

10 A number of polynucleotide sequences have been identified that are differentially expressed between cells derived from high metastatic potential lung cancer tissue and low metastatic lung cancer cells. Expression of these sequences in lung cancer tissue can be valuable in determining diagnostic, prognostic and/or treatment information. For example, sequences that are highly expressed in the high metastatic potential cells are associated can be indicative of increased expression of genes or regulatory sequences involved in the metastatic process. A patient sample displaying an increased level of one or more of these

polynucleotides may thus warrant more aggressive treatment. In another example, sequences that display higher expression in the low metastatic potential cells can be associated with genes or regulatory sequences that inhibit metastasis, and thus the expression of these polynucleotides in a sample may warrant a more positive prognosis than the gross pathology would suggest.

The differential expression of these polynucleotides can be used as a diagnostic marker, a prognostic marker, for risk assessment, patient treatment and the like. These polynucleotide sequences can also be used in combination with other known molecular and/or biochemical markers.

The following table summarizes identified polynucleotides with differential expression between high metastatic potential lung cancer cells and low metastatic potential lung cancer cells:

Table 9 Differentially expressed polynucleotides: High metastatic potential lung cancer vs. low metastatic lung cancer cells

SEQ ID NO.	Differential Expression	Cluster ID	Clones in 1 st Library	Clones in 2 nd Library	Ratio
400	High Lung > Low Lung (Lib8 > Lib 9)	14929	23	16	2.008868
9	High Lung > Low Lung (Lib8 > Lib9)	2623	6	1	8.384840
34	High Lung > Low Lung (Lib8 > Lib9)	5832	5	0	6.987366
42	High Lung > Low Lung (Lib8 > Lib9)	307	79	27	4.088903
62	High Lung > Low Lung (Lib8 > Lib9)	2623	6	1	8.384840
74	High Lung > Low Lung (Lib8 > Lib9)	6268	5	0	6.987366
106	High Lung > Low Lung (Lib8 > Lib9)	10717	8	0	11.17978
119	High Lung > Low Lung (Lib8 > Lib9)	8	1355	122	15.52111
361	High Lung > Low Lung (Lib8 > Lib9)	1120	5	0	6.987366
369	High Lung > Low Lung (Lib8 > Lib9)	2790	6	0	8.384840
371	High Lung > Low Lung (Lib8 > Lib9)	8847	6	1	8.384840
379	High Lung > Low Lung (Lib8 > Lib9)	260	15	0	20.96210
395	High Lung > Low Lung (Lib8 > Lib9)	13538	9	1	12.57726
135	Low Lung > High Lung (Lib9 > Lib8)	36313	30	1	21.46731
154	Low Lung > High Lung (Lib9 > Lib8)	5345	27	6	3.220097
160	Low Lung > High Lung (Lib9 > Lib8)	4386	21	3	5.009039
260	Low Lung > High Lung (Lib9 > Lib8)	4141	27	4	4.830145
308	Low Lung > High Lung (Lib9 > Lib8)	15855	213	12	12.70149
323	Low Lung > High Lung (Lib9 > Lib8)	5257	25	5	3.577885
349	Low Lung > High Lung (Lib9 > Lib8)	2797	14	1	10.01807
381	Low Lung > High Lung (Lib9 > Lib8)	2428	19	2	6.797982

Example 7: Polynucleotides Differentially Expressed in High Metastatic Potential Colon Cancer Cells Versus Low Metastatic Colon Cancer Cells

A number of polynucleotide sequences have been identified that are differentially expressed between cells derived from high metastatic potential colon cancer tissue and low

metastatic colon cancer cells. Expression of these sequences in colon cancer tissue can be valuable in determining diagnostic, prognostic and/or treatment information. For example, sequences that are highly expressed in the high metastatic potential cells can be indicative of increased expression of genes or regulatory sequences involved in the metastatic process. A patient sample displaying an increased level of one or more of these polynucleotides may thus warrant more aggressive treatment. In another example, sequences that display higher expression in the low metastatic potential cells can be associated with genes or regulatory sequences that inhibit metastasis, and thus the expression of these polynucleotides in a sample may warrant a more positive prognosis than the gross pathology would suggest.

The differential expression of these polynucleotides can be used as a diagnostic marker, a prognostic marker, for risk assessment, patient treatment and the like. These polynucleotide sequences can also be used in combination with other known molecular and/or biochemical markers.

The following table summarizes identified polynucleotides with differential expression between high metastatic potential colon cancer cells and low metastatic potential colon cancer cells:

Table 11: Differentially expressed polynucleotides: High metastatic potential colon cancer vs. low metastatic colon cancer cells

SEQ ID NO.	Differential Expression	Cluster ID	Clones in 1 st Library	Clones in 2 nd Library	Ratio
1	High Colon > Low Colon (Lib1 > Lib2)	6660	7	0	6.489973
176	High Colon > Low Colon (Lib1 > Lib2)	3765	19	6	2.935940
241	High Colon > Low Colon (Lib1 > Lib2)	4275	11	2	5.099264
362	High Colon > Low Colon (Lib1 > Lib2)	6420	8	0	7.417112
374	High Colon > Low Colon (Lib1 > Lib2)	6420	8	0	7.417112
39	Low Colon > High Colon (Lib2 > Lib1)	4016	14	5	3.020043
97	Low Colon > High Colon (Lib2 > Lib1)	945	21	9	2.516702
134	Low Colon > High Colon (Lib2 > Lib1)	2464	19	5	4.098630
317	Low Colon > High Colon (Lib2 > Lib1)	1577	40	12	3.595289
357	Low Colon > High Colon (Lib2 > Lib1)	4309	13	4	3.505407

Example 8: Polynucleotides Differentially Expressed at Higher Levels in High Metastatic Potential Colon Cancer Patient Tissue Versus Normal Patient Tissue

A number of polynucleotide sequences have been identified that are differentially expressed between cells derived from high metastatic potential colon cancer tissue and normal tissue. Expression of these sequences in colon cancer tissue can be valuable in determining diagnostic, prognostic and/or treatment information. For example, sequences that are highly expressed in the high metastatic potential cells are associated can be

indicative of increased expression of genes or regulatory sequences involved in the advanced disease state which involves processes such as angiogenesis, dedifferentiation, cell replication, and metastasis. A patient sample displaying an increased level of one or more of these polynucleotides may thus warrant more aggressive treatment.

5 The differential expression of these polynucleotides can be used as a diagnostic marker, a prognostic marker, for risk assessment, patient treatment and the like. These polynucleotide sequences can also be used in combination with other known molecular and/or biochemical markers.

10 The following table summarizes identified polynucleotides with differential expression between high metastatic potential colon cancer cells and normal colon cells:

Table 11: Differentially expressed polynucleotides: High metastatic potential colon tissue vs. normal colon tissue

SEQ ID NO.	Differential Expression	Cluster ID	Clones in 1 st Library	Clones in 2 nd Library	Ratio
52	High Colon Metastasis Tissue > Normal Colon Tissue of UC#3 (Lib20 > Lib18)	19	10	0	11.69918
52	High Colon Metastasis Tissue > Normal Tissue in UC#2 (Lib17 > Lib15)	19	13	2	6.025646
172	High Colon Metastasis Tissue > Normal Tissue in UC#2 (Lib17 > Lib15)	102	65	22	2.738930

15 **Example 9:** Polynucleotides Differentially Expressed at Higher Levels in High Colon Tumor Potential Patient Tissue Versus Metastasized Colon Cancer Patient Tissue

20 A number of polynucleotide sequences have been identified that are differentially expressed between cells derived from high tumor potential colon cancer tissue and cells derived from high metastatic potential colon cancer cells. Expression of these sequences in colon cancer tissue can be valuable in determining diagnostic, prognostic and/or treatment information associated with the transformation of precancerous tissue to malignant tissue. This information can be useful in the prevention of achieving the advanced malignant state in these tissues, and can be important in risk assessment for a patient.

25 The following table summarizes identified polynucleotides with differential expression between high tumor potential colon cancer tissue and cells derived from high metastatic potential colon cancer cells:

Table 12: Differentially expressed polynucleotides: High tumor potential colon tissue vs. metastatic colon tissue

SEQ ID NO.	Differential Expression	Cluster ID	Clones in 1 st Library	Clones in 2 nd Library	Ratio
52	High Colon Tumor Tissue > Metastasis Tissue of UC#3 (Lib19 > Lib20)	19	69	10	5.160829
119	High Colon Tumor Tissue > Metastasis Tissue of UC#3 (Lib19 > Lib20)	8	14	1	10.47124
172	High Colon Tumor Tissue > Metastasis Tissue of UC#3 (Lib19 > Lib20)	102	43	10	3.216168

5 **Example 10:** Polynucleotides Differentially Expressed at Higher Levels in High Tumor Potential Colon Cancer Patient Tissue Versus Normal Patient Tissue

A number of polynucleotide sequences have been identified that are differentially expressed between cells derived from high tumor potential colon cancer tissue and normal tissue. Expression of these sequences in colon cancer tissue can be valuable in determining
 10 diagnostic, prognostic and/or treatment information associated with the prevention of achieving the malignant state in these tissues, and can be important in risk assessment for a patient. For example, sequences that are highly expressed in the potential colon cancer cells are associated with or can be indicative of increased expression of genes or regulatory sequences involved in early tumor progression. A patient sample displaying an increased
 15 level of one or more of these polynucleotides may thus warrant closer attention or more frequent screening procedures to catch the malignant state as early as possible.

The following table summarizes identified polynucleotides with differential expression between high metastatic potential colon cancer cells and normal colon cells:

20 **Table 13:** Differentially expressed polynucleotides: High tumor potential colon tissue vs. normal colon tissue

SEQ ID NO.	Differential Expression	Cluster ID	Clones in 1 st Library	Clones in 2 nd Library	Ratio
52	High Colon Tumor Tissue > Normal Tissue of UC#2 (Lib16 > Lib15)	19	13	2	6.255508
288	High Colon Tumor Tissue > Normal Tissue of UC#2 (Lib16 > Lib15)	1267	7	0	6.125253
52	High Colon Tumor Tissue > Normal Tissue of UC#3 (Lib19 > Lib18)	19	69	0	60.37750
119	High Colon Tumor Tissue > Normal Tissue of UC#3 (Lib19 > Lib18)	8	14	1	12.25050
172	High Colon Tumor Tissue > Normal Tissue of UC#3 (Lib19 > Lib18)	102	43	7	5.375222

Example 11: Polynucleotides Differentially Expressed Across Multiple Libraries

A number of polynucleotide sequences have been identified that are differentially expressed between cancerous cells and normal cells across all three tissue types tested (*i.e.*, breast, colon, and lung). Expression of these sequences in a tissue or any origin can be valuable in determining diagnostic, prognostic and/or treatment information associated with the prevention of achieving the malignant state in these tissues, and can be important in risk assessment for a patient. These polynucleotides can also serve as non-tissue specific markers of, for example, risk of metastasis of a tumor. The following table summarizes identified polynucleotides that were differentially expressed but without tissue type-specificity in the breast, colon, and lung libraries tested.

Table 14: Polynucleotides Differentially Expressed Across Multiple Library Comparisons

SEQ ID NO.	Differential Expression	Cluster ID	Clones in 1 st Library	Clones in 2 nd Library	Ratio
9	High Breast > Low Breast (Lib3 > Lib4)	2623	31	4	7.561356
	High Lung > Low Lung (Lib8 > Lib9)	2623	6	1	8.384840
39	Low Breast > High Breast (Lib4 > Lib3)	4016	6	0	6.149690
	Low Colon > High Colon (Lib2 > Lib1)	4016	14	5	3.020043
42	High Breast > Low Breast (Lib3 > Lib4)	307	196	75	2.549721
	High Lung > Low Lung (Lib8 > Lib9)	307	79	27	4.088903
52	High Breast > Low Breast (Lib3 > Lib4)	19	1364	525	2.534854
	High Colon Metastasis Tissue > Normal Colon Tissue of UC#3 (Lib20 > Lib18)	19	10	0	11.69918
	High Colon Metastasis Tissue > Normal Tissue in UC#2 (Lib17 > Lib15)	19	13	2	6.025646
	High Colon Tumor Tissue > Metastasis Tissue of UC#3 (Lib19 > Lib20)	19	69	10	5.160829
	High Colon Tumor Tissue > Normal Tissue of UC#2 (Lib16 > Lib15)	19	13	2	6.255508
	High Colon Tumor Tissue > Normal Tissue of UC#3 (Lib19 > Lib18)	19	69	0	60.37750
62	High Breast > Low Breast (Lib3 > Lib4)	2623	31	4	7.561356
	High Lung > Low Lung (Lib8 > Lib9)	2623	6	1	8.384840
74	High Lung > Low Lung (Lib8 > Lib9)	6268	5	0	6.987366
	Low Breast > High Breast (Lib4 > Lib3)	6268	18	3	6.149690
119	High Colon Tumor Tissue > Metastasis Tissue of UC#3 (Lib19 > Lib20)	8	14	1	10.47124
	High Colon Tumor Tissue > Normal Tissue of UC#3 (Lib19 > Lib18)	8	14	1	12.25050
	High Lung > Low Lung (Lib8 > Lib9)	8	1355	122	15.52111
172	High Breast > Low Breast (Lib3 > Lib4)	102	278	116	2.338217
	High Colon Metastasis Tissue > Normal Tissue in UC#2 (Lib17 > Lib15)	102	65	22	2.738930
	High Colon Tumor Tissue > Metastasis	102	43	10	3.216168

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SEQ ID NO.	Differential Expression	Cluster ID	Clones in 1 st Library	Clones in 2 nd Library	Ratio
	Tissue of UC#3 (Lib19 > Lib20)				
	High Colon Tumor Tissue > Normal Tissue of UC#3 (Lib19 > Lib18)	102	43	7	5.375222
317	High Breast > Low Breast (Lib3 > Lib4)	1577	25	3	8.130490
	Low Colon > High Colon (Lib2 > Lib1)	1577	40	12	3.595289
379	High Breast > Low Breast (Lib3 > Lib4)	260	27	2	13.17139
	High Lung > Low Lung (Lib8 > Lib9)	260	15	0	20.96210

Example 12: Polynucleotides Exhibiting Colon-Specific Expression

The cDNA libraries described herein were also analyzed to identify those polynucleotides that were specifically expressed in colon cells or tissue, *i.e.*, the

- 5 polynucleotides were identified in libraries prepared from colon cell lines or tissue, but not in libraries of breast or lung origin. The polynucleotides that were expressed in a colon cell line and/or in colon tissue, but were present in the breast or lung cDNA libraries described herein, are shown in Table 15.

10 **Table 15** Polynucleotides specifically expressed in colon cells.

SEQ ID NO.	Cluster	Clones in 1 st Library	Clones in 2 nd Library	SEQ ID NO.	Cluster	Clones in 1 st Library	Clones in 2 nd Library
5	36535	2	0	229	39648	2	0
13	27250	2	0	231	85064	1	0
19	16283	3	0	234	39391	2	0
24	16918	4	0	236	39498	2	0
26	40108	2	0	242	22113	3	0
32	32663	1	1	247	19255	2	0
43	39833	2	0	252	22814	3	0
47	18957	3	0	253	39563	2	0
48	39508	2	0	254	39420	2	0
56	7005	8	2	257	39412	2	0
58	18957	3	0	261	38085	2	0
59	18957	3	0	265	40054	1	0
60	16283	3	0	266	39423	2	0
64	13238	4	1	267	39453	2	0
70	39442	2	0	270	78091	1	0
71	17036	4	0	276	39168	2	0
73	7005	8	2	277	39458	2	0
83	11476	6	0	278	14391	3	1
86	39425	2	0	279	39195	2	0
94	21847	2	1	282	12977	5	0
100	16731	3	1	284	14391	3	1
101	12439	4	0	290	16347	4	0
113	17055	4	0	293	39478	2	0
120	67907	1	0	294	39392	2	0
121	12081	4	0	297	39180	2	0
124	39174	2	0	299	6867	7	3

WO 99/33982				PCT/US98/27610			
SEQ ID NO.	Cluster	Clones in 1 st Library	Clones in 2 nd Library	SEQ ID NO.	Cluster	Clones in 1 st Library	Clones in 2 nd Library
126	8210	2	6	301	41633	1	1
128	40455	2	0	302	23218	3	0
139	22195	3	0	303	39380	2	0
143	86859	1	0	309	84328	1	0
150	8672	4	4	314	14367	3	0
153	16977	4	0	320	39886	2	0
156	17036	4	0	324	9061	5	2
159	40044	2	0	327	16653	3	1
161	40044	2	0	328	16985	4	0
163	22155	3	0	329	12977	5	0
166	15066	4	0	330	9061	5	2
170	11465	5	0	333	16392	3	0
176	3765	19	6	342	39486	2	0
181	86110	1	0	344	6874	6	3
182	39648	2	0	345	6874	6	3
185	17076	4	0	353	11494	4	0
186	22794	2	0	354	17062	3	0
187	39171	2	0	355	16245	4	0
194	40455	2	0	356	83103	1	0
199	16317	3	0	358	13072	4	1
210	39186	2	0	366	14364	1	0
211	40122	2	0	368	84182	1	0
218	26295	2	0	372	56020	1	0
222	4665	5	9	389	7514	5	3
226	82498	1	0	391	7570	5	3
227	35702	2	0	393	23210	3	0

In addition to the above, SEQ ID NOS:159 and 161 were each present in one clone in each of Lib16 (Normal Colon Tumor Tissue), and SEQ ID NOS:344 and 345 were each present in one clone in Lib17 (High Colon Metastasis Tissue). No clones corresponding to the colon-specific polynucleotides in the table above were present in any of Libraries 3, 4, 8, or 9. The polynucleotide provided above can be used as markers of cells of colon origin, and find particular use in reference arrays, as described above.

Example 13: Identification of Contiguous Sequences Having a Polynucleotide of the Invention

The novel polynucleotides were used to screen publicly available and proprietary databases to determine if any of the polynucleotides of SEQ ID NOS:1-404 would facilitate identification of a contiguous sequence, *e.g.*, the polynucleotides would provide sequence that would result in 5' extension of another DNA sequence, resulting in production of a longer contiguous sequence composed of the provided polynucleotide and the other DNA sequence(s). Contigging was performed using the AssemblyLign program with the following

parameters: 1) Overlap: Minimum Overlap Length: 30; % Stringency: 50; Minimum Repeat Length: 30; Alignment: gap creation penalty: 1.00, gap extension penalty: 1.00; 2) Consensus: % Base designation threshold: 80.

Using these parameters, 44 polynucleotides provided contiged sequences. These
5 contiged sequences are provided as SEQ ID NOS:801-844. The contiged sequences can be correlated with the sequences of SEQ ID NOS:1-404 upon which the contiged sequences are based by identifying those sequences of SEQ ID NOS:1-404 and the contiged sequences of SEQ ID NOS:801-844 that share the same clone name in Table 1. It should be noted that of these 44 sequences that provided a contiged sequence, the following members of that group
10 of 44 did not contig using the overlap settings indicated in parentheses (Stringency/Overlap): SEQ ID NO:804 (30%/10); SEQ ID NO:810 (20%/20); SEQ ID NO:812 (30%/10); SEQ ID NO:814 (40%/20); SEQ ID NO:816 (30%/10); SEQ ID NO:832 (30%/10); SEQ ID NO:840 (20%/20); SEQ ID NO:841 (40%/20). To generalize, the indicated polynucleotides did not contig using a minimum 20% stringency, 10 overlap. There was a corresponding increase in
15 the number of degenerate codons in these sequences.

The contiged sequences (SEQ ID NO:801-844) thus represent longer sequences that encompass a polynucleotide sequence of the invention. The contiged sequences were then translated in all three reading frames to determine the best alignment with individual sequences using the BLAST programs as described above for SEQ ID NOS:1-404 and the
20 validation sequences SEQ ID NOS:405-800. Again the sequences were masked using the XBLAST program for masking low complexity as described above in Example 1 (Table 2). Several of the contiged sequences were found to encode polypeptides having characteristics of a polypeptide belonging to a known protein families (and thus represent new members of these protein families) and/or comprising a known functional domain (Table 16). Thus the
25 invention encompasses fragments, fusions, and variants of such polynucleotides that retain biological activity associated with the protein family and/or functional domain identified herein.

Table 16. Profile hits using contiged sequences

SEQ ID NO.	Sequence Name	Profile	Start (Stop)	Score
809	Contig_RTA00000177AF.n.18.3. Seq_THC123051	ATPases	778 (1612)	6040
824	Contig_RTA00000187AF.g.24.1. Seq_THC168636	homeobox	531 (707)	12080
824	Contig_RTA00000187AF.g.24.1. Seq_THC168636	MAP kinase kinase	769 (1494)	5784
833	Contig_RTA00000190AF.j.4.1. Seq_THC228776	protein kinase	170 (1010)	5027
833	Contig_RTA00000190AF.j.4.1. Seq_THC228776	protein kinase	170 (1010)	5027

All stop/start sequences are provided in the forward direction.

5 The profiles for the ATPases (AAA) and protein kinase families are described above in Example 2. The homeobox and MAP kinase kinase protein families are described further below.

Homeobox domain. The 'homeobox' is a protein domain of 60 amino acids (Gehring In: Guidebook to the Homeobox Genes, Duboule D., Ed., pp1-10, Oxford University Press, Oxford, (1994); Buerklin In: Guidebook to the Homeobox Genes, pp25-72, Oxford University Press, Oxford, (1994); Gehring *Trends Biochem. Sci.* (1992) 17:277-280; Gehring *et al Annu. Rev. Genet.* (1986) 20:147-173; Schofield *Trends Neurosci.* (1987) 10:3-6; <http://copan.bioz.unibas.ch/homeo.html>) first identified in number of Drosophila homeotic and segmentation proteins. It is extremely well conserved in many other animals, including vertebrates. This domain binds DNA through a helix-turn-helix type of structure. Several proteins that contain a homeobox domain play an important role in development. Most of these proteins are sequence-specific DNA-binding transcription factors. The homeobox domain is also very similar to a region of the yeast mating type proteins. These are sequence-specific DNA-binding proteins that act as master switches in yeast differentiation by controlling gene expression in a cell type-specific fashion.

A schematic representation of the homeobox domain is shown below. The helix-turn-helix region is shown by the symbols 'H' (for helix), and 't' (for turn).

[illegible]

The pattern detects homeobox sequences 24 residues long and spans positions 34 to 57 of the homeobox domain. The consensus pattern is as follows: [LIVMFYVG]-[ASLVR]-x(2)-[LIVMSTACN]-x-[LIVM]-x(4)-[LIV]-[RKNQUESTAIY]-[LIVFSTNKH]-W-[FYVC]-x-[NDQTAH]-x(5)-[RKNAIMW].

5 MAP kinase kinase (MAPKK). MAP kinases (MAPK) are involved in signal transduction, and are important in cell cycle and cell growth controls. The MAP kinase kinases (MAPKK) are dual-specificity protein kinases which phosphorylate and activate MAP kinases. MAPKK homologues have been found in yeast, invertebrates, amphibians, and mammals. Moreover, the MAPKK/MAPK phosphorylation switch constitutes a basic
10 module activated in distinct pathways in yeast and in vertebrates. MAPKK regulation studies have led to the discovery of at least four MAPKK convergent pathways in higher organisms. One of these is similar to the yeast pheromone response pathway which includes the *ste11* protein kinase. Two other pathways require the activation of either one or both of the serine/threonine kinase-encoded oncogenes *c-Raf-1* and *c-Mos*. Additionally, several
15 studies suggest a possible effect of the cell cycle control regulator cyclin-dependent kinase 1 (*cdc2*) on MAPKK activity. Finally, MAPKKs are apparently essential transducers through which signals must pass before reaching the nucleus. For review, see, *e.g.*, *Biologique Cell* (1993) 79:193-207; Nishida *et al.*, *Trends Biochem Sci* (1993) 18:128-31; Ruderman *Curr Opin Cell Biol* (1993) 5:207-13; Dhanasekaran *et al.*, *Oncogene* (1998) 17:1447-55;
20 Kiefer *et al.*, *Biochem Soc Trans* (1997) 25:491-8; and Hill, *Cell Signal* (1996) 8:533-44.

Those skilled in the art will recognize, or be able to ascertain, using not more than routine experimentation, many equivalents to the specific embodiments of the invention described herein. Such specific embodiments and equivalents are intended to be encompassed by the following claims.

25 All publications and patent applications cited in this specification are herein incorporated by reference as if each individual publication or patent application were specifically and individually indicated to be incorporated by reference. The citation of any publication is for its disclosure prior to the filing date and should not be construed as an admission that the present invention is not entitled to antedate such publication by virtue of
30 prior invention.

Although the foregoing invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is readily apparent to those of ordinary skill in the art in light of the teachings of this invention that certain changes and modifications may be made thereto without departing from the spirit or scope of the
5 appended claims.

Deposit Information:

The following materials were deposited with the American Type Culture Collection:
CMCC = (Chiron Master Culture Collection)

10

Cell Lines Deposited with ATCC

Cell Line	Deposit Date	ATCC Accession No.	CMCC Accession No.
KM12L4-A	March 19, 1998	CRL-12496	11606
Km12C	May 15, 1998	CRL-12533	11611
MDA-MB-231	May 15, 1998	CRL-12532	10583
MCF-7	October 9, 1998	CRL-12584	10377

cDNA Library ES1 - ATCC#
Deposit Date - December 22, 1998

Clone Name	Cluster ID	Sequence Name
M00001395A:C03	4016	79.A1.sp6:130016.Seq
M00001395A:C03	4016	RTA00000118A.c.4.1
M00001449A:D12	3681	RTA00000131A.g.15.2
M00001449A:D12	3681	79.E1.sp6:130064.Seq
M00001452A:D08	1120	79.C2.sp6:130041.Seq
M00001452A:D08	1120	RTA00000118A.p.15.3
M00001513A:B06	4568	79.D4.sp6:130055.Seq
M00001513A:B06	4568	RTA00000122A.d.15.3
M00001517A:B07	4313	79.F4.sp6:130079.Seq
M00001517A:B07	4313	RTA00000122A.n.3.1
M00001533A:C11	2428	RTA00000123A.l.21.1
M00001533A:C11	2428	79.A5.sp6:130020.Seq
M00001533A:C11	2428	RTA00000123A.l.21.1.Seq_THC205063
M00001542A:A09	22113	79.F5.sp6:130080.Seq
M00001542A:A09	22113	RTA00000125A.c.7.1

cDNA Library ES2 - ATCC#
Deposit Date - December 22, 1998

Clone Name	Cluster ID	Sequence Name
M00001343C:F10	2790	80.E1.sp6:130256.Seq
M00001343C:F10	2790	RTA00000177AF.e.2.1.Seq_THC229461
M00001343C:F10	2790	RTA00000177AF.e.2.1
M00001343D:H07	23255	100.C1.sp6:131446.Seq
M00001343D:H07	23255	RTA00000177AF.e.14.3.Seq_THC228776
M00001343D:H07	23255	80.F1.sp6:130268.Seq
M00001343D:H07	23255	RTA00000177AF.e.14.3
M00001345A:E01	6420	172.E1.sp6:133925.Seq
M00001345A:E01	6420	RTA00000177AF.f.10.3
M00001345A:E01	6420	RTA00000177AF.f.10.3.Seq_THC226443
M00001345A:E01	6420	80.G1.sp6:130280.Seq
M00001347A:B10	13576	80.D2.sp6:130245.Seq
M00001347A:B10	13576	100.E1.sp6:131470.Seq
M00001347A:B10	13576	RTA00000177AF.g.16.1
M00001353A:G12	8078	80.E3.sp6:130258.Seq
M00001353A:G12	8078	RTA00000177AR.l.13.1
M00001353A:G12	8078	172.C3.sp6:133903.Seq
M00001353D:D10	14929	RTA00000177AF.m.1.2
M00001353D:D10	14929	80.F3.sp6:130270.Seq
M00001353D:D10	14929	172.D3.sp6:133915.Seq
M00001361A:A05	4141	80.B4.sp6:130223.Seq
M00001361A:A05	4141	RTA00000177AF.p.20.3
M00001362B:D10	5622	80.D4.sp6:130247.Seq
M00001362B:D10	5622	RTA00000178AF.a.11.1

cDNA Library ES3 - ATCC#

Deposit Date - December 22, 1998

Clone Name	Cluster ID	Sequence Name
M00001362C:H11	945	RTA00000178AR.a.20.1
M00001362C:H11	945	100.E4.sp6:131473.Seq
M00001362C:H11	945	80.E4.sp6:130259.Seq
M00001362C:H11	945	180.C2.sp6:135940.Seq
M00001376B:G06	17732	RTA00000178AR.i.2.2
M00001376B:G06	17732	80.B5.sp6:130224.Seq
M00001387A:C05	2464	80.D6.sp6:130249.Seq
M00001387A:C05	2464	RTA00000178AF.n.18.1
M00001412B:B10	8551	RTA00000179AF.p.21.1
M00001412B:B10	8551	80.G7.sp6:130286.Seq
M00001415A:H06	13538	80.B8.sp6:130227.Seq
M00001415A:H06	13538	RTA00000180AF.a.24.1
M00001416B:H11	8847	80.C8.sp6:130239.Seq
M00001416B:H11	8847	RTA00000180AF.b.16.1
M00001429D:D07	40392	RTA00000180AF.j.8.1
M00001429D:D07	40392	80.H9.sp6:130300.Seq
M00001448D:H01	36313	80.A11.sp6:130218.Seq
M00001448D:H01	36313	RTA00000181AF.e.23.1

cDNA Library ES4 - ATCC#

Deposit Date - December 22, 1998

Clone Name	Cluster ID	Sequence Name
M00001463C:B11	19	RTA00000182AF.b.7.1
M00001463C:B11	19	89.D1.sp6:130703.Seq
M00001470A:B10	1037	89.F2.sp6:130728.Seq
M00001470A:B10	1037	RTA00000121A.f.8.1
M00001497A:G02	2623	89.F3.sp6:130729.Seq
M00001497A:G02	2623	RTA00000183AF.a.6.1
M00001500A:E11	2623	RTA00000183AF.b.14.1
M00001500A:E11	2623	89.A4.sp6:130670.Seq
M00001501D:C02	9685	RTA00000183AF.c.11.1.Seq_THC109544
M00001501D:C02	9685	RTA00000183AF.c.11.1
M00001501D:C02	9685	89.C4.sp6:130694.Seq
M00001504C:H06	6974	89.F4.sp6:130730.Seq
M00001504C:H06	6974	RTA00000183AF.d.9.1
M00001504C:H06	6974	RTA00000183AF.d.9.1.Seq_THC223129
M00001504D:G06	6420	173.F5.SP6:134133.Seq
M00001504D:G06	6420	89.G4.sp6:130742.Seq
M00001504D:G06	6420	RTA00000183AF.d.11.1.Seq_THC226443
M00001504D:G06	6420	RTA00000183AF.d.11.1
M00001528A:C04	35555	89.B6.sp6:130684.Seq
M00001528A:C04	7337	RTA00000123A.b.17.1
M00001528A:C04	35555	184.A5.sp6:135530.Seq

cDNA Library ES5 - ATCC#

Deposit Date - December 22, 1998

Clone Name	Cluster ID	Sequence Name
M00001537B:G07	3389	RTA00000183AF.m.19.1
M00001537B:G07	3389	89.A8.sp6:130674.Seq
M00001541A:D02	3765	89.C8.sp6:130698.Seq
M00001541A:D02	3765	RTA00000135A.d.1.1
M00001544B:B07	6974	89.A9.sp6:130675.Seq
M00001544B:B07	6974	RTA00000184AF.a.15.1
M00001546A:G11	1267	89.D9.sp6:130711.Seq
M00001546A:G11	1267	RTA00000125A.o.5.1
M00001549B:F06	4193	89.G9.sp6:130747.Seq
M00001549B:F06	4193	RTA00000184AF.e.13.1
M00001556A:F11	1577	173.C9.SP6:134101.Seq
M00001556A:F11	1577	89.F11.sp6:130737.Seq
M00001556A:F11	1577	RTA00000184AF.i.23.1
M00001556B:C08	4386	RTA00000184AF.j.4.1
M00001556B:C08	4386	89.H11.sp6:130761.Seq

cDNA Library ES6 - ATCC#

Deposit Date - December 22, 1998

Clone Name	Cluster ID	Sequence Name
M00001563B:F06	102	RTA00000184AF.o.5.1
M00001563B:F06	102	90.B1.sp6:130871.Seq
M00001571C:H06	5749	90.E1.sp6:130907.Seq
M00001571C:H06	5749	RTA00000185AF.a.19.1
M00001594B:H04	260	90.D2.sp6:130896.Seq
M00001594B:H04	260	RTA00000185AR.i.12.2
M00001597C:H02	4837	90.E2.sp6:130908.Seq
M00001597C:H02	4837	RTA00000185AR.k.3.2
M00001624C:F01	4309	90.C4.sp6:130886.Seq
M00001624C:F01	4309	RTA00000186AF.e.22.1
M00001679A:A06	6660	90.F6.sp6:130924.Seq
M00001679A:A06	6660	122.B5.sp6:132089.Seq
M00001679A:A06	6660	RTA00000187AF.h.15.1
M00003759B:B09	697	90.G8.sp6:130938.Seq
M00003759B:B09	697	RTA00000188AF.d.6.1
M00003759B:B09	697	RTA00000188AF.d.6.1.Seq_THC178884
M00003844C:B11	6539	176.D9.sp6:134556.Seq
M00003844C:B11	6539	RTA00000189AF.d.22.1
M00003844C:B11	6539	90.B10.sp6:130880.Seq
M00003857A:G10	3389	90.A11.sp6:130869.Seq
M00003857A:G10	3389	RTA00000189AF.g.3.1

cDNA Library ES7 - ATCC#

Deposit Date - December 22, 1998

Clone Name	Cluster ID	Sequence Name
M00003914C:F05	3900	99.E1.sp6:131278.Seq
M00003914C:F05	3900	RTA00000190AF.g.13.1
M00003922A:E06	23255	RTA00000190AF.j.4.1
M00003922A:E06	23255	99.F1.sp6:131290.Seq
M00003922A:E06	23255	RTA00000190AF.j.4.1.Seq_THC228776
M00003983A:A05	9105	99.C3.sp6:131256.Seq
M00003983A:A05	9105	RTA00000191AF.a.21.2
M00004028D:A06	6124	RTA00000191AR.e.2.3
M00004028D:A06	6124	99.D3.sp6:131268.Seq
M00004031A:A12	9061	RTA00000191AR.e.11.2
M00004031A:A12	9061	RTA00000191AR.e.11.3
M00004087D:A01	6880	RTA00000191AF.m.20.1
M00004087D:A01	6880	99.A5.sp6:131234.Seq
M00004108A:E06	4937	99.E5.sp6:131282.Seq
M00004108A:E06	4937	RTA00000191AF.p.21.1
M00004114C:F11	13183	123.D5.sp6:132305.Seq
M00004114C:F11	13183	RTA00000192AF.a.24.1
M00004114C:F11	13183	99.G5.sp6:131306.Seq

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Clone Name	Cluster ID	Sequence Name
M00004146C:C11	5257	99.B6.sp6:131247.Seq
M00004146C:C11	5257	177.F5.sp6:134768.Seq
M00004146C:C11	5257	RTA00000192AF.f.3.1
M00004146C:C11	5257	RTA00000192AF.f.3.1.Seq_THC213833
M00004157C:A09	6455	RTA00000192AF.g.23.1
M00004157C:A09	6455	99.D6.sp6:131271.Seq
M00004157C:A09	6455	123.E7.sp6:132319.Seq
M00004172C:D08	11494	RTA00000192AF.j.6.1
M00004172C:D08	11494	99.G6.sp6:131307.Seq
M00004172C:D08	11494	177.E6.sp6:134757.Seq
M00004229B:F08	6455	RTA00000193AF.b.9.1
M00004229B:F08	6455	99.C8.sp6:131261.Seq

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Clone Name	Cluster ID	Sequence Name
M00001466A:E07	4275	RTA00000120A.j.14.1
M00001531A:H11		89.F6.sp6:130732.Seq
M00001531A:H11		RTA00000123A.g.19.1
M00001551A:B10	6268	79.G9.sp6:130096.Seq
M00001551A:B10	6268	184.C12.sp6:135561.Seq
M00001551A:B10	6268	RTA00000126A.o.23.1
M00001552A:B12	307	RTA00000136A.o.4.2
M00001552A:B12	307	79.C7.sp6:130046.Seq
M00001556A:H01	15855	RTA00000184AF.j.1.1
M00001586C:C05	4623	RTA00000185AF.f.4.1
M00001604A:B10	1399	79.G8.sp6:130095.Seq
M00001604A:B10	1399	RTA00000129A.o.10.1
M00003879B:C11	5345	RTA00000189AF.l.19.1
M00003879B:C11	5345	90.B12.sp6:130882.Seq

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Clone Name	Cluster ID	Sequence Name
M00001358C:C06		RTA00000177AF.o.4.3
M00001388D:G05	5832	80.F6.sp6:130273.Seq
M00001388D:G05	5832	RTA00000178AF.o.23.1
M00001394A:F01	6583	RTA00000179AF.d.13.1
M00001394A:F01	6583	172.B8.sp6:133896.Seq
M00001394A:F01	6583	80.H6.sp6:130297.Seq
M00001429A:H04	2797	RTA00000180AF.i.19.1
M00001447A:G03	10717	RTA00000181AF.d.10.1
M00001448D:C09	8	80.H10.sp6:130301.Seq
M00001448D:C09	8	RTA00000181AF.e.17.1
M00001448D:C09	8	100.B11.sp6:131444.Seq
M00001454D:G03	689	RTA00000181AR.l.22.1

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Clone Name	Cluster ID	Sequence Name
M00003975A:G11	12439	RTA00000190AF.o.24.1
M00003978B:G05	5693	RTA00000190AF.p.17.2.Seq_THC173318
M00003978B:G05	5693	RTA00000190AF.p.17.2
M00004059A:D06	5417	RTA00000191AF.h.19.1
M00004068B:A01	3706	99.C4.sp6:131257.Seq
M00004068B:A01	3706	RTA00000191AF.i.17.2
M00004205D:F06		99.E7.sp6:131284.Seq
M00004205D:F06		177.G7.sp6:134782.Seq
M00004205D:F06		RTA00000192AF.o.11.1
M00004212B:C07	2379	RTA00000192AF.p.8.1
M00004223A:G10	16918	RTA00000193AF.a.16.1

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Clone Name	Cluster ID	Sequence Name
M00004223B:D09	7899	RTA00000193AF.a.17.1
M00004249D:G12		RTA00000193AF.c.22.1
M00004251C:G07		RTA00000193AF.d.2.1
M00004372A:A03	2030	RTA00000193AF.m.20.1

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Clone Name	Cluster ID	Sequence Name
M00001340B:A06	17062	80.A1.sp6:130208.Seq
M00001340B:A06	17062	RTA00000177AF.b.8.4
M00001340D:F10	11589	80.B1.sp6:130220.Seq
M00001340D:F10	11589	RTA00000177AF.b.17.4
M00001341A:E12	4443	80.C1.sp6:130232.Seq
M00001341A:E12	4443	RTA00000177AF.b.20.4
M00001342B:E06	39805	80.D1.sp6:130244.Seq
M00001342B:E06	39805	RTA00000177AF.c.21.3
M00001346A:F09	5007	RTA00000177AF.g.2.1
M00001346A:F09	5007	80.H1.sp6:130292.Seq
M00001346D:G06	5779	RTA00000177AF.g.14.3
M00001346D:G06	5779	RTA00000177AF.g.14.1
M00001348B:B04	16927	80.E2.sp6:130257.Seq
M00001348B:B04	16927	RTA00000177AF.h.9.3
M00001348B:G06	16985	RTA00000177AF.h.10.1
M00001348B:G06	16985	80.F2.sp6:130269.Seq
M00001349B:B08	3584	RTA00000177AF.h.20.1
M00001349B:B08	3584	80.G2.sp6:130281.Seq
M00001350A:H01	7187	100.C2.sp6:131447.Seq
M00001350A:H01	7187	80.A3.sp6:130210.Seq
M00001350A:H01	7187	RTA00000177AF.i.8.2
M00001352A:E02	16245	RTA00000177AF.k.9.3
M00001352A:E02	16245	172.D2.sp6:133914.Seq
M00001352A:E02	16245	80.D3.sp6:130246.Seq
M00001355B:G10	14391	RTA00000177AF.m.17.3
M00001355B:G10	14391	80.G3.sp6:130282.Seq
M00001355B:G10	14391	172.H3.sp6:133963.Seq
M00001355B:G10	14391	100.E3.sp6:131472.Seq
M00001361D:F08	2379	80.C4.sp6:130235.Seq
M00001361D:F08	2379	RTA00000178AF.a.6.1
M00001365C:C10	40132	RTA00000178AF.c.7.1
M00001365C:C10	40132	80.F4.sp6:130271.Seq
M00001368D:E03		80.G4.sp6:130283.Seq
M00001368D:E03		RTA00000178AF.d.20.1
M00001370A:C09	6867	80.H4.sp6:130295.Seq
M00001370A:C09	6867	RTA00000178AF.e.12.1
M00001371C:E09	7172	100.A5.sp6:131426.Seq
M00001371C:E09	7172	RTA00000178AF.f.9.1
M00001371C:E09	7172	80.A5.sp6:130212.Seq
M00001378B:B02	39833	80.C5.sp6:130236.Seq
M00001378B:B02	39833	RTA00000178AF.i.23.1
M00001379A:A05	1334	80.D5.sp6:130248.Seq
M00001379A:A05	1334	RTA00000178AF.j.7.1
M00001380D:B09	39886	RTA00000178AF.j.24.1
M00001380D:B09	39886	80.E5.sp6:130260.Seq
M00001381D:E06		80.F5.sp6:130272.Seq
M00001381D:E06		RTA00000178AF.k.16.1
M00001382C:A02	22979	80.G5.sp6:130284.Seq
M00001382C:A02	22979	RTA00000178AF.k.22.1
M00001384B:A11		80.B6.sp6:130225.Seq
M00001384B:A11		RTA00000178AF.m.13.1
M00001386C:B12	5178	80.C6.sp6:130237.Seq

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Clone Name	Cluster ID	Sequence Name
M00001386C:B12	5178	RTA00000178AF.n.10.1
M00001387B:G03	7587	80.E6.sp6:130261.Seq
M00001387B:G03	7587	RTA00000178AF.n.24.1
M00001389A:C08	16269	RTA00000178AF.p.1.1
M00001389A:C08	16269	80.G6.sp6:130285.Seq
M00001396A:C03	4009	172.D8.sp6:133920.Seq
M00001396A:C03	4009	80.A7.sp6:130214.Seq
M00001396A:C03	4009	RTA00000179AF.e.20.1
M00001400B:H06		172.B9.sp6:133897.Seq
M00001400B:H06		80.B7.sp6:130226.Seq
M00001400B:H06		RTA00000179AF.j.13.1
M00001400B:H06		RTA00000179AF.j.13.1.Seq_THC105720
M00001402A:E08	39563	80.C7.sp6:130238.Seq
M00001402A:E08	39563	RTA00000179AF.k.20.1
M00001407B:D11	5556	RTA00000179AF.n.10.1
M00001407B:D11	5556	80.D7.sp6:130250.Seq
M00001410A:D07	7005	180.H5.sp6:136003.Seq
M00001410A:D07	7005	RTA00000179AF.o.22.1
M00001410A:D07	7005	80.F7.sp6:130274.Seq
M00001414A:B01		RTA00000180AF.a.9.1
M00001414A:B01		80.H7.sp6:130298.Seq
M00001414C:A07		80.A8.sp6:130215.Seq
M00001414C:A07		RTA00000180AF.a.11.1
M00001416A:H01	7674	79.C1.sp6:130040.Seq
M00001416A:H01	7674	RTA00000118A.g.9.1
M00001417A:E02	36393	RTA00000180AF.c.2.1
M00001417A:E02	36393	80.D8.sp6:130251.Seq
M00001423B:E07	15066	RTA00000180AF.e.24.1
M00001423B:E07	15066	80.H8.sp6:130299.Seq
M00001424B:G09	10470	80.A9.sp6:130216.Seq
M00001424B:G09	10470	RTA00000180AF.f.18.1
M00001425B:H08	22195	RTA00000180AF.g.7.1
M00001425B:H08	22195	80.B9.sp6:130228.Seq
M00001426B:D12		RTA00000180AF.g.22.1
M00001426B:D12		80.C9.sp6:130240.Seq
M00001426D:C08	4261	80.D9.sp6:130252.Seq
M00001426D:C08	4261	RTA00000180AF.h.5.1
M00001428A:H10	84182	100.G9.sp6:131502.Seq
M00001428A:H10	84182	RTA00000180AF.h.19.1
M00001428A:H10	84182	80.E9.sp6:130264.Seq
M00001449A:A12	5857	80.B11.sp6:130230.Seq
M00001449A:A12	5857	RTA00000118A.g.14.1
M00001449A:B12	41633	80.C11.sp6:130242.Seq
M00001449A:B12	41633	RTA00000118A.g.16.1
M00001449A:G10	36535	RTA00000181AF.f.5.1
M00001449A:G10	36535	80.D11.sp6:130254.Seq
M00001449A:G10	36535	100.D11.sp6:131468.Seq
M00001449C:D06	86110	RTA00000181AF.f.12.1
M00001449C:D06	86110	80.E11.sp6:130266.Seq
M00001450A:A02	39304	RTA00000118A.j.21.1.Seq_THC151859
M00001450A:A02	39304	RTA00000118A.j.21.1
M00001450A:A02	39304	79.F1.sp6:130076.Seq

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Clone Name	Cluster ID	Sequence Name
M00001450A:A02	39304	180.G9.sp6:135995.Seq
M00001450A:A11	32663	80.F11.sp6:130278.Seq
M00001450A:A11	32663	RTA00000118A.l.8.1
M00001450A:B12	82498	100.F11.sp6:131492.Seq
M00001450A:B12	82498	RTA00000118A.m.10.1
M00001450A:B12	82498	79.G1.sp6:130088.Seq
M00001450A:D08	27250	80.G11.sp6:130290.Seq
M00001450A:D08	27250	180.B10.sp6:135936.Seq
M00001450A:D08	27250	RTA00000181AF.g.10.1
M00001452A:B04	84328	RTA00000118A.p.10.1
M00001452A:B04	84328	79.A2.sp6:130017.Seq
M00001452A:B12	86859	RTA00000118A.p.8.1
M00001452A:B12	86859	79.B2.sp6:130029.Seq
M00001452A:F05	85064	RTA00000131A.m.23.1
M00001452A:F05	85064	79.D2.sp6:130053.Seq
M00001452C:B06	16970	80.H11.sp6:130302.Seq
M00001452C:B06	16970	100.C12.sp6:131457.Seq
M00001452C:B06	16970	RTA00000181AR.i.18.2
M00001453A:E11	16130	80.A12.sp6:130219.Seq
M00001453A:E11	16130	100.D12.sp6:131469.Seq
M00001453A:E11	16130	RTA00000119A.c.13.1
M00001453C:F06	16653	80.B12.sp6:130231.Seq
M00001453C:F06	16653	RTA00000181AF.k.5.3
M00001454A:A09	83103	RTA00000119A.e.24.2
M00001454A:A09	83103	79.G2.sp6:130089.Seq
M00001454B:C12	7005	121.D1.sp6:131917.Seq
M00001454B:C12	7005	RTA00000181AF.k.24.1
M00001454B:C12	7005	80.C12.sp6:130243.Seq
M00001455B:E12	13072	80.F12.sp6:130279.Seq
M00001455B:E12	13072	RTA00000181AR.m.5.2
M00001460A:F06	2448	89.A1.sp6:130667.Seq
M00001460A:F06	2448	RTA00000119A.j.21.1
M00001461A:D06	1531	89.C1.sp6:130691.Seq
M00001461A:D06	1531	RTA00000119A.o.3.1
M00001465A:B11	10145	79.F3.sp6:130078.Seq
M00001465A:B11	10145	RTA00000120A.g.12.1
M00001467A:B07	38759	89.F1.sp6:130727.Seq
M00001467A:B07	38759	RTA00000120A.m.12.3
M00001467A:D04	39508	RTA00000120A.o.2.1
M00001467A:D04	39508	89.G1.sp6:130739.Seq
M00001467A:E10	39442	89.A2.sp6:130668.Seq
M00001467A:E10	39442	RTA00000120A.o.21.1
M00001468A:F05	7589	RTA00000120A.p.23.1
M00001468A:F05	7589	89.B2.sp6:130680.Seq
M00001469A:A01		RTA00000121A.c.10.1
M00001469A:A01		89.C2.sp6:130692.Seq
M00001469A:C10	12081	89.D2.sp6:130704.Seq
M00001469A:C10	12081	RTA00000133A.d.14.2
M00001469A:H12	19105	89.E2.sp6:130716.Seq
M00001469A:H12	19105	RTA00000133A.e.15.1
M00001470A:C04	39425	89.G2.sp6:130740.Seq
M00001470A:C04	39425	RTA00000133A.f.1.1

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Clone Name	Cluster ID	Sequence Name
M00001471A:B01	39478	89.H2.sp6:130752.Seq
M00001471A:B01	39478	RTA00000133A.i.5.1
M00001487B:H06		RTA00000182AF.l.15.1
M00001487B:H06		89.B3.sp6:130681.Seq
M00001488B:F12		RTA00000182AF.l.20.1
M00001488B:F12		89.C3.sp6:130693.Seq
M00001494D:F06	7206	RTA00000182AF.o.15.1
M00001494D:F06	7206	89.E3.sp6:130717.Seq
M00001499B:A11	10539	RTA00000183AF.a.24.1
M00001499B:A11	10539	89.G3.sp6:130741.Seq
M00001499B:A11	10539	173.B5.SP6:134085.Seq
M00001500A:C05	5336	RTA00000183AF.b.13.1
M00001500A:C05	5336	89.H3.sp6:130753.Seq
M00001504A:E01		RTA00000183AF.c.24.1
M00001504A:E01		89.D4.sp6:130706.Seq
M00001504A:E01		RTA00000183AF.c.24.1.Seq_THC125912
M00001504C:A07	10185	RTA00000183AF.d.5.1
M00001504C:A07	10185	89.E4.sp6:130718.Seq
M00001505C:C05		89.H4.sp6:130754.Seq
M00001505C:C05		RTA00000183AF.e.1.1
M00001506D:A09		89.A5.sp6:130671.Seq
M00001506D:A09		RTA00000183AF.e.23.1
M00001506D:A09		121.G6.sp6:131958.Seq
M00001507A:H05	39168	RTA00000121A.l.10.1
M00001507A:H05	39168	89.B5.sp6:130683.Seq
M00001535A:F10	39423	79.C5.sp6:130044.Seq
M00001535A:F10	39423	RTA00000134A.k.22.1
M00001541A:H03	39174	79.E5.sp6:130068.Seq
M00001541A:H03	39174	RTA00000124A.n.13.1
M00001544A:G02	19829	79.H5.sp6:130104.Seq
M00001544A:G02	19829	RTA00000125A.h.24.4
M00001545A:D08	13864	RTA00000125A.m.9.1
M00001545A:D08	13864	79.B6.sp6:130033.Seq
M00001551A:F05	39180	RTA00000126A.n.8.2
M00001551A:F05	39180	79.A7.sp6:130022.Seq
M00001552A:D11	39458	RTA00000126A.p.15.2
M00001552A:D11	39458	79.D7.sp6:130058.Seq
M00001557A:F03	39490	RTA00000128A.b.4.1

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Clone Name	Cluster ID	Sequence Name
M00001511A:H06	39412	RTA00000133A.k.17.1
M00001511A:H06	39412	89.C5.sp6:130695.Seq
M00001512A:A09	39186	89.D5.sp6:130707.Seq
M00001512A:A09	39186	RTA00000121A.p.15.1
M00001512D:G09	3956	89.E5.sp6:130719.Seq
M00001512D:G09	3956	173.H5.SP6:134157.Seq
M00001512D:G09	3956	RTA00000183AF.g.3.1
M00001513B:G03		RTA00000183AF.g.9.1
M00001513B:G03		89.F5.sp6:130731.Seq
M00001513B:G03		RTA00000183AF.g.9.1.Seq_THC198280
M00001513C:E08	14364	RTA00000183AF.g.12.1
M00001513C:E08	14364	89.G5.sp6:130743.Seq
M00001514C:D11	40044	RTA00000183AF.g.22.1
M00001514C:D11	40044	RTA00000183AF.g.22.1.Seq_THC232899
M00001514C:D11	40044	89.H5.sp6:130755.Seq
M00001518C:B11	8952	89.A6.sp6:130672.Seq
M00001518C:B11	8952	RTA00000183AF.h.15.1
M00001528B:H04	8358	89.D6.sp6:130708.Seq
M00001528B:H04	8358	RTA00000183AF.i.5.1
M00001531A:D01	38085	RTA00000123A.e.15.1
M00001531A:D01	38085	89.E6.sp6:130720.Seq
M00001534A:C04	16921	RTA00000183AF.k.6.1
M00001534A:C04	16921	89.H6.sp6:130756.Seq
M00001534A:D09	5097	RTA00000134A.k.1.1
M00001534A:D09	5097	RTA00000134A.k.1.1.Seq_THC215869
M00001534C:A01	4119	RTA00000183AF.k.16.1
M00001534C:A01	4119	89.C7.sp6:130697.Seq
M00001535A:C06	20212	89.E7.sp6:130721.Seq
M00001535A:C06	20212	RTA00000134A.l.22.1.Seq_THC128232
M00001535A:C06	20212	RTA00000134A.l.22.1
M00001536A:B07	2696	RTA00000134A.m.13.1
M00001536A:B07	2696	89.F7.sp6:130733.Seq
M00001537A:F12	39420	89.H7.sp6:130757.Seq
M00001537A:F12	39420	RTA00000134A.o.23.1
M00001540A:D06	8286	89.B8.sp6:130686.Seq
M00001540A:D06	8286	RTA00000183AF.o.1.1
M00001542A:E06	39453	89.E8.sp6:130722.Seq
M00001542A:E06	39453	RTA00000135A.g.11.1
M00001544A:E06		RTA00000184AF.a.8.1
M00001544A:E06		173.G7.SP6:134147.Seq
M00001544A:E06		89.H8.sp6:130758.Seq
M00001545A:B02		89.B9.sp6:130687.Seq
M00001545A:B02		RTA00000135A.l.2.2
M00001548A:E10	5892	89.E9.sp6:130723.Seq
M00001548A:E10	5892	RTA00000184AF.d.11.1
M00001548A:E10	5892	RTA00000184AF.d.11.1.Seq_THC161896
M00001549C:E06	16347	89.H9.sp6:130759.Seq
M00001549C:E06	16347	RTA00000184AF.e.15.1
M00001550A:A03	7239	89.A10.sp6:130676.Seq
M00001550A:A03	7239	RTA00000126A.m.4.2
M00001550A:G01	5175	RTA00000184AF.f.3.1
M00001550A:G01	5175	89.B10.sp6:130688.Seq

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Clone Name	Cluster ID	Sequence Name
M00001551A:G06	22390	RTA00000136A.j.13.1
M00001551A:G06	22390	89.C10.sp6:130700.Seq
M00001551C:G09	3266	RTA00000184AR.g.1.1
M00001551C:G09	3266	89.D10.sp6:130712.Seq
M00001553A:H06	8298	RTA00000127A.d.19.1
M00001553A:H06	8298	89.G10.sp6:130748.Seq
M00001553B:F12	4573	89.H10.sp6:130760.Seq
M00001553B:F12	4573	RTA00000184AF.h.9.1
M00001555A:B02	39539	RTA00000127A.i.21.1
M00001555A:B02	39539	89.B11.sp6:130689.Seq
M00001555A:C01	39195	89.C11.sp6:130701.Seq
M00001555A:C01	39195	RTA00000137A.c.16.1
M00001555D:G10	4561	RTA00000184AF.i.21.1
M00001555D:G10	4561	89.D11.sp6:130713.Seq
M00001556A:C09	9244	89.E11.sp6:130725.Seq
M00001556A:C09	9244	RTA00000127A.l.3.1
M00001556B:G02	11294	RTA00000184AF.j.6.1
M00001556B:G02	11294	89.A12.sp6:130678.Seq
M00001557B:H10	5192	173.E9.SP6:134125.Seq
M00001557B:H10	5192	RTA00000184AF.k.2.1
M00001557B:H10	5192	89.D12.sp6:130714.Seq
M00001557D:D09	8761	RTA00000184AF.k.12.1
M00001557D:D09	8761	89.E12.sp6:130726.Seq
M00001558B:H11	7514	RTA00000184AF.k.21.1
M00001558B:H11	7514	89.G12.sp6:130750.Seq
M00001559B:F01		89.H12.sp6:130762.Seq
M00001559B:F01		RTA00000184AF.l.11.1
M00001560D:F10	6558	90.A1.sp6:130859.Seq
M00001560D:F10	6558	RTA00000184AF.m.21.1
M00001566B:D11		RTA00000184AF.p.3.1
M00001566B:D11		90.D1.sp6:130895.Seq
M00001583D:A10	6293	RTA00000185AF.e.11.1
M00001583D:A10	6293	90.A2.sp6:130860.Seq
M00001590B:F03		RTA00000185AF.g.11.1
M00001590B:F03		90.C2.sp6:130884.Seq
M00001597D:C05	10470	RTA00000185AF.k.6.1
M00001597D:C05	10470	90.F2.sp6:130920.Seq
M00001598A:G03	16999	90.G2.sp6:130932.Seq
M00001598A:G03	16999	RTA00000185AF.k.9.1
M00001601A:D08	22794	RTA00000138A.b.5.1
M00001601A:D08	22794	90.H2.sp6:130944.Seq
M00001607A:E11	11465	RTA00000185AF.m.19.1
M00001607A:E11	11465	90.A3.sp6:130861.Seq
M00001608A:B03	7802	RTA00000185AF.n.5.1
M00001608A:B03	7802	90.B3.sp6:130873.Seq
M00001608B:E03	22155	RTA00000185AF.n.9.1
M00001608B:E03	22155	90.C3.sp6:130885.Seq
M00001608D:A11		RTA00000185AF.n.12.1
M00001608D:A11		90.D3.sp6:130897.Seq
M00001614C:F10	13157	RTA00000186AF.a.6.1
M00001614C:F10	13157	90.E3.sp6:130909.Seq
M00001617C:E02	17004	RTA00000186AF.b.21.1

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Clone Name	Cluster ID	Sequence Name
M00001617C:E02	17004	90.F3.sp6:130921.Seq
M00001619C:F12	40314	90.G3.sp6:130933.Seq
M00001619C:F12	40314	RTA00000186AF.c.15.1
M00001621C:C08	40044	RTA00000186AF.d.1.1
M00001621C:C08	40044	RTA00000186AF.d.1.1.Seq_THC232899
M00001621C:C08	40044	90.H3.sp6:130945.Seq
M00001621C:C08	40044	122.E1.sp6:132121.Seq
M00001623D:F10	13913	RTA00000186AF.e.6.1
M00001623D:F10	13913	90.A4.sp6:130862.Seq
M00001632D:H07		RTA00000186AF.h.14.1.Seq_THC112525
M00001632D:H07		RTA00000186AF.h.14.1
M00001632D:H07		90.E4.sp6:130910.Seq
M00001632D:H07		176.A3.sp6:134514.Seq
M00001644C:B07	39171	RTA00000186AF.l.7.1
M00001644C:B07	39171	90.F4.sp6:130922.Seq
M00001644C:B07	39171	217.A12.sp6:139369.Seq
M00001645A:C12	19267	RTA00000186AF.l.12.1.Seq_THC178183
M00001645A:C12	19267	176.G3.sp6:134586.Seq
M00001645A:C12	19267	RTA00000186AF.l.12.1
M00001645A:C12	19267	90.G4.sp6:130934.Seq
M00001648C:A01	4665	90.H4.sp6:130946.Seq
M00001648C:A01	4665	RTA00000186AF.m.3.1
M00001657D:C03	23201	RTA00000187AF.a.14.1
M00001657D:C03	23201	90.B5.sp6:130875.Seq
M00001657D:F08	76760	90.C5.sp6:130887.Seq
M00001657D:F08	76760	RTA00000187AF.a.15.1
M00001662C:A09	23218	RTA00000187AR.c.5.2
M00001662C:A09	23218	90.D5.sp6:130899.Seq
M00001663A:E04	35702	90.E5.sp6:130911.Seq
M00001663A:E04	35702	RTA00000187AR.c.15.2
M00001669B:F02	6468	90.F5.sp6:130923.Seq
M00001669B:F02	6468	RTA00000187AF.d.15.1
M00001670C:H02	14367	90.G5.sp6:130935.Seq
M00001670C:H02	14367	RTA00000187AF.e.8.1
M00001673C:H02	7015	90.H5.sp6:130947.Seq
M00001673C:H02	7015	RTA00000187AF.f.18.1
M00001675A:C09	8773	RTA00000187AF.f.24.1
M00001675A:C09	8773	90.A6.sp6:130864.Seq
M00001675A:C09	8773	RTA00000187AF.f.24.1.Seq_THC220002
M00001676B:F05	11460	RTA00000187AF.g.12.1
M00001676B:F05	11460	90.B6.sp6:130876.Seq
M00001676B:F05	11460	219.F2.sp6:139035.Seq
M00001677D:A07	7570	90.D6.sp6:130900.Seq
M00001677D:A07	7570	RTA00000187AF.g.24.1
M00001677D:A07	7570	RTA00000187AF.g.24.1.Seq_THC168636
M00001678D:F12	4416	90.E6.sp6:130912.Seq
M00001678D:F12	4416	RTA00000187AF.h.13.1
M00001679A:F10	26875	RTA00000187AF.i.1.1
M00001679A:F10	26875	90.A7.sp6:130865.Seq
M00001679B:F01	6298	90.B7.sp6:130877.Seq
M00001679B:F01	6298	RTA00000187AR.i.10.2
M00001680D:F08	10539	90.F7.sp6:130925.Seq

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Clone Name	Cluster ID	Sequence Name
M00001680D:F08	10539	219.F6.sp6:139039.Seq
M00001680D:F08	10539	RTA00000187AF.l.7.1
M00001682C:B12	17055	90.G7.sp6:130937.Seq
M00001682C:B12	17055	RTA00000187AF.m.3.1
M00001682C:B12	17055	176.D6.sp6:134553.Seq
M00001688C:F09	5382	90.A8.sp6:130866.Seq
M00001688C:F09	5382	RTA00000187AF.m.23.2
M00001693C:G01	4393	RTA00000187AF.n.17.1
M00001693C:G01	4393	90.B8.sp6:130878.Seq
M00001716D:H05	67252	RTA00000187AF.o.6.1
M00001716D:H05	67252	90.C8.sp6:130890.Seq
M00003741D:C09	40108	90.D8.sp6:130902.Seq
M00003741D:C09	40108	RTA00000187AF.o.24.1
M00003747D:C05	11476	RTA00000187AF.p.19.1
M00003747D:C05	11476	90.E8.sp6:130914.Seq
M00003747D:C05	11476	RTA00000187AF.p.19.1.Seq_THC108482
M00003747D:C05	11476	219.H8.sp6:139065.Seq
M00003754C:E09		90.F8.sp6:130926.Seq
M00003754C:E09		RTA00000188AF.b.12.1
M00003761D:A09		RTA00000188AF.d.11.1
M00003761D:A09		90.H8.sp6:130950.Seq
M00003761D:A09		RTA00000188AF.d.11.1.Seq_THC212094
M00003762C:B08	17076	RTA00000188AF.d.21.1.Seq_THC208760
M00003762C:B08	17076	90.A9.sp6:130867.Seq
M00003762C:B08	17076	RTA00000188AF.d.21.1
M00003763A:F06	3108	RTA00000188AF.d.24.1
M00003763A:F06	3108	90.B9.sp6:130879.Seq
M00003774C:A03	67907	RTA00000188AF.g.11.1.Seq_THC123222
M00003774C:A03	67907	RTA00000188AF.g.11.1
M00003774C:A03	67907	90.C9.sp6:130891.Seq
M00003784D:D12		RTA00000188AF.i.8.1
M00003784D:D12		90.D9.sp6:130903.Seq
M00003839A:D08	7798	RTA00000189AF.c.18.1
M00003839A:D08	7798	90.A10.sp6:130868.Seq
M00003851B:D08		90.D10.sp6:130904.Seq
M00003851B:D08		RTA00000189AF.f.7.1
M00003851B:D10	13595	90.E10.sp6:130916.Seq
M00003851B:D10	13595	RTA00000189AF.f.8.1
M00003853A:D04	5619	90.F10.sp6:130928.Seq
M00003853A:D04	5619	RTA00000189AF.f.17.1
M00003853A:F12	10515	90.G10.sp6:130940.Seq
M00003853A:F12	10515	RTA00000189AF.f.18.1
M00003856B:C02	4622	90.H10.sp6:130952.Seq
M00003856B:C02	4622	RTA00000189AF.g.1.1
M00003857A:H03	4718	90.B11.sp6:130881.Seq
M00003857A:H03	4718	RTA00000189AF.g.5.1.Seq_THC196102
M00003857A:H03	4718	RTA00000189AF.g.5.1

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Clone Name	Cluster ID	Sequence Name
M00003867A:D10		90.C11.sp6:130893.Seq
M00003867A:D10		RTA00000189AF.h.17.1
M00003871C:E02	4573	RTA00000189AF.j.12.1
M00003875C:G07	8479	90.G11.sp6:130941.Seq
M00003875C:G07	8479	RTA00000189AF.j.22.1
M00003875D:D11		90.H11.sp6:130953.Seq
M00003875D:D11		RTA00000189AF.j.23.1
M00003876D:E12	7798	90.A12.sp6:130870.Seq
M00003876D:E12	7798	RTA00000189AF.k.12.1
M00003906C:E10	9285	90.H12.sp6:130954.Seq
M00003906C:E10	9285	RTA00000190AF.d.7.1
M00003907D:A09	39809	99.A1.sp6:131230.Seq
M00003907D:A09	39809	RTA00000190AF.e.3.1.Seq_THC150217
M00003907D:A09	39809	RTA00000190AF.e.3.1
M00003907D:H04	16317	99.B1.sp6:131242.Seq
M00003907D:H04	16317	RTA00000190AF.e.6.1
M00003909D:C03	8672	RTA00000190AF.f.11.1
M00003909D:C03	8672	99.C1.sp6:131254.Seq
M00003968B:F06	24488	RTA00000190AF.n.16.1
M00003968B:F06	24488	99.C2.sp6:131255.Seq
M00003970C:B09	40122	RTA00000190AF.n.23.1
M00003970C:B09	40122	RTA00000190AF.n.23.1.Seq_THC109227
M00003970C:B09	40122	99.D2.sp6:131267.Seq
M00003974D:E07	23210	RTA00000190AF.o.20.1
M00003974D:E07	23210	RTA00000190AF.o.20.1.Seq_THC207240
M00003974D:E07	23210	99.E2.sp6:131279.Seq
M00003974D:H02	23358	RTA00000190AF.o.21.1.Seq_THC207240
M00003974D:H02	23358	RTA00000190AF.o.21.1
M00003974D:H02	23358	99.F2.sp6:131291.Seq
M00003981A:E10	3430	99.A3.sp6:131232.Seq
M00003981A:E10	3430	RTA00000191AF.a.9.1
M00003982C:C02	2433	RTA00000191AF.a.15.2
M00003982C:C02	2433	99.B3.sp6:131244.Seq
M00003982C:C02	2433	RTA00000191AF.a.15.2.Seq_THC79498
M00004028D:C05	40073	RTA00000191AF.e.3.1
M00004028D:C05	40073	99.E3.sp6:131280.Seq
M00004035C:A07	37285	99.H3.sp6:131316.Seq
M00004035C:A07	37285	RTA00000191AF.f.11.1
M00004035D:B06	17036	RTA00000191AF.f.13.1
M00004035D:B06	17036	99.A4.sp6:131233.Seq
M00004072A:C03		RTA00000191AF.j.9.1
M00004072A:C03		99.D4.sp6:131269.Seq
M00004081C:D10	15069	99.F4.sp6:131293.Seq
M00004081C:D10	15069	RTA00000191AF.l.6.1
M00004086D:G06	9285	99.H4.sp6:131317.Seq
M00004086D:G06	9285	RTA00000191AF.m.18.1
M00004105C:A04	7221	99.D5.sp6:131270.Seq
M00004105C:A04	7221	RTA00000191AF.p.9.1
M00004171D:B03	4908	RTA00000192AF.j.2.1
M00004171D:B03	4908	99.F6.sp6:131295.Seq
M00004185C:C03	11443	RTA00000192AF.l.13.2
M00004185C:C03	11443	123.A8.sp6:132272.Seq

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Clone Name	Cluster ID	Sequence Name
M00004185C:C03	11443	99.A7.sp6:131236.Seq
M00004191D:B11		RTA00000192AF.m.12.1
M00004191D:B11		99.B7.sp6:131248.Seq
M00004191D:B11		123.C8.sp6:132296.Seq
M00004197D:H01	8210	99.C7.sp6:131260.Seq
M00004197D:H01	8210	123.E8.sp6:132320.Seq
M00004197D:H01	8210	RTA00000192AF.n.13.1
M00004203B:C12	14311	99.D7.sp6:131272.Seq
M00004203B:C12	14311	RTA00000192AF.o.2.1
M00004214C:H05	11451	177.D8.sp6:134747.Seq
M00004214C:H05	11451	RTA00000192AF.p.17.1
M00004223D:E04	12971	RTA00000193AF.a.20.1
M00004223D:E04	12971	99.B8.sp6:131249.Seq
M00004269D:D06	4905	99.H8.sp6:131321.Seq
M00004269D:D06	4905	RTA00000193AF.e.14.1
M00004295D:F12	16921	99.D9.sp6:131274.Seq
M00004295D:F12	16921	RTA00000193AF.h.15.1
M00004296C:H07	13046	99.E9.sp6:131286.Seq
M00004296C:H07	13046	RTA00000193AF.h.19.1
M00004307C:A06	9457	RTA00000193AF.i.14.2
M00004307C:A06	9457	99.F9.sp6:131298.Seq
M00004307C:A06	9457	123.D11.sp6:132311.Seq
M00004312A:G03	26295	RTA00000193AF.i.24.2
M00004312A:G03	26295	99.G9.sp6:131310.Seq
M00004312A:G03	26295	RTA00000193AF.i.24.2.Seq_THC197345
M00004318C:D10	21847	RTA00000193AF.j.9.1
M00004318C:D10	21847	99.H9.sp6:131322.Seq
M00004359B:G02		RTA00000193AF.m.5.1.Seq_THC173318
M00004359B:G02		RTA00000193AF.m.5.1
M00004505D:F08		RTA00000194AF.b.19.1
M00004505D:F08		99.H10.sp6:131323.Seq
M00004692A:H08		99.B11.sp6:131252.Seq
M00004692A:H08		RTA00000194AF.c.24.1
M00004692A:H08		377.F4.sp6:141957.Seq
M00005180C:G03		RTA00000194AF.f.4.1

Clone Name	Cluster ID	Sequence Name
M00001346D:E03	6806	RTA00000177AF.g.13.3
M00001350A:B08		80.H2.sp6:130293.Seq
M00001350A:B08		RTA00000177AF.i.6.2
M00001357D:D11	4059	RTA00000177AF.n.18.3.Seq_THC123051
M00001357D:D11	4059	RTA00000177AF.n.18.3
M00001409C:D12	9577	RTA00000179AF.o.17.1
M00001409C:D12	9577	80.E7.sp6:130262.Seq
M00001418B:F03	9952	RTA00000180AF.c.20.1
M00001418B:F03	9952	RTA00000180AF.c.20.1.Seq_THC162284
M00001418B:F03	9952	80.E8.sp6:130263.Seq
M00001418D:B06	8526	RTA00000180AF.d.1.1
M00001421C:F01	9577	RTA00000180AF.d.23.1
M00001421C:F01	9577	80.G8.sp6:130287.Seq
M00001429B:A11	4635	RTA00000180AF.i.20.1
M00001432C:F06		RTA00000180AF.k.24.1
M00001439C:F08	40054	RTA00000180AF.p.10.1
M00001442C:D07	16731	RTA00000181AF.a.20.1
M00001442C:D07	16731	80.C10.sp6:130241.Seq
M00001443B:F01		80.D10.sp6:130253.Seq
M00001443B:F01		RTA00000181AF.b.7.1
M00001445A:F05	13532	80.E10.sp6:130265.Seq
M00001445A:F05	13532	RTA00000181AF.c.4.1
M00001446A:F05	7801	RTA00000181AF.c.21.1
M00001455A:E09	13238	RTA00000181AF.m.4.1
M00001455A:E09	13238	RTA00000181AF.m.4.1.Seq_THC140691
M00001460A:F12	39498	RTA00000119A.j.20.1
M00001481D:A05	7985	RTA00000182AR.j.2.1
M00001490B:C04	18699	RTA00000182AF.m.16.1
M00001490B:C04	18699	89.D3.sp6:130705.Seq
M00001500C:E04	9443	89.B4.sp6:130682.Seq
M00001500C:E04	9443	RTA00000183AF.c.1.1
M00001532B:A06	3990	89.G6.sp6:130744.Seq
M00001532B:A06	3990	RTA00000183AF.j.11.1
M00001534A:F09	5321	89.B7.sp6:130685.Seq
M00001534A:F09	5321	RTA00000183AF.k.8.1
M00001535A:B01	7665	RTA00000134A.l.19.1
M00001536A:C08	39392	89.G7.sp6:130745.Seq
M00001536A:C08	39392	RTA00000134A.m.16.1
M00001541A:F07	22085	RTA00000135A.e.5.2
M00001542B:B01		RTA00000183AF.p.4.1
M00001542B:B01		89.F8.sp6:130734.Seq
M00001544A:E03	12170	RTA00000125A.h.18.4
M00001545A:C03	19255	RTA00000135A.m.18.1
M00001545A:C03	19255	184.B10.sp6:135547.Seq
M00001545A:C03	19255	89.C9.sp6:130699.Seq
M00001548A:H09	1058	RTA00000126A.e.20.3.Seq_THC217534
M00001548A:H09	1058	RTA00000126A.e.20.3
M00001548A:H09	1058	79.F6.sp6:130081.Seq
M00001549A:B02	4015	RTA00000136A.e.12.1
M00001549A:B02	4015	79.G6.sp6:130093.Seq
M00001549A:D08	10944	RTA00000126A.h.17.2
M00001552B:D04	5708	RTA00000184AF.g.12.1

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Clone Name	Cluster ID	Sequence Name
M00001552B:D04	5708	89.E10.sp6:130724.Seq
M00001552D:A01		89.F10.sp6:130736.Seq
M00001552D:A01		RTA00000184AF.g.22.1
M00001553D:D10	22814	RTA00000184AF.h.14.1
M00001553D:D10	22814	89.A11.sp6:130677.Seq
M00001558A:H05		RTA00000128A.c.20.1
M00001558A:H05		89.F12.sp6:130738.Seq
M00001561A:C05	39486	RTA00000128A.m.22.2
M00001561A:C05	39486	79.B8.sp6:130035.Seq
M00001564A:B12	5053	RTA00000184AF.o.12.1
M00001578B:E04	23001	RTA00000185AF.c.24.1
M00001579D:C03	6539	90.G1.sp6:130931.Seq
M00001579D:C03	6539	173.A12.SP6:134080.Seq
M00001579D:C03	6539	RTA00000185AF.d.11.1
M00001582D:F05		RTA00000185AF.d.24.1
M00001587A:B11	39380	RTA00000129A.e.24.1
M00001587A:B11	39380	79.E8.sp6:130071.Seq
M00001604A:F05	39391	RTA00000138A.c.3.1
M00001604A:F05	39391	79.A9.sp6:130024.Seq
M00001624A:B06	3277	RTA00000138A.l.5.1
M00001624A:B06	3277	217.E1.sp6:139406.Seq
M00001624A:B06	3277	90.B4.sp6:130874.Seq
M00001630B:H09	5214	90.D4.sp6:130898.Seq
M00001630B:H09	5214	122.C2.sp6:132098.Seq
M00001630B:H09	5214	RTA00000186AF.g.11.1
M00001651A:H01		RTA00000186AF.n.7.1
M00001651A:H01		90.A5.sp6:130863.Seq
M00001677C:E10	14627	RTA00000187AF.g.23.1
M00001679C:F01	78091	90.C7.sp6:130889.Seq
M00001679C:F01	78091	RTA00000187AF.j.6.1
M00001679C:F01	78091	176.G5.sp6:134588.Seq
M00001686A:E06	4622	RTA00000187AF.m.15.2
M00003796C:D05	5619	RTA00000188AF.l.9.1.Seq_THC167845
M00003796C:D05	5619	RTA00000188AF.l.9.1
M00003826B:A06	11350	RTA00000189AF.a.24.2
M00003826B:A06	11350	90.F9.sp6:130927.Seq
M00003833A:E05	21877	RTA00000189AF.b.21.1
M00003837D:A01	7899	90.H9.sp6:130951.Seq
M00003837D:A01	7899	RTA00000189AF.c.10.1
M00003846B:D06	6874	RTA00000189AF.e.9.1
M00003846B:D06	6874	90.C10.sp6:130892.Seq
M00003879B:D10	31587	RTA00000189AF.l.20.1
M00003879B:D10	31587	90.C12.sp6:130894.Seq
M00003879D:A02	14507	90.D12.sp6:130906.Seq
M00003879D:A02	14507	RTA00000189AR.l.23.2
M00003891C:H09		90.G12.sp6:130942.Seq
M00003891C:H09		RTA00000189AF.p.8.1
M00003912B:D01	12532	99.D1.sp6:131266.Seq
M00003912B:D01	12532	RTA00000190AF.g.2.1
M00004072B:B05	17036	RTA00000191AF.j.10.1
M00004081C:D12	14391	RTA00000191AF.l.7.1
M00004111D:A08	6874	RTA00000192AF.a.14.1

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Deposit Date - December 22, 1998

Clone Name	Cluster ID	Sequence Name
M00004111D:A08	6874	99.F5.sp6:131294.Seq
M00004121B:G01		177.H4.sp6:134791.Seq
M00004121B:G01		99.H5.sp6:131318.Seq
M00004121B:G01		RTA00000192AF.c.2.1
M00004138B:H02	13272	99.A6.sp6:131235.Seq
M00004138B:H02	13272	RTA00000192AF.e.3.1
M00004151D:B08	16977	RTA00000192AF.g.3.1
M00004169C:C12	5319	99.E6.sp6:131283.Seq
M00004169C:C12	5319	RTA00000192AF.i.12.1
M00004169C:C12	5319	123.F7.sp6:132331.Seq
M00004183C:D07	16392	RTA00000192AF.l.1.1
M00004183C:D07	16392	RTA00000192AF.l.1.1.Seq_THC202071
M00004230B:C07	7212	RTA00000193AF.b.14.1
M00004230B:C07	7212	99.D8.sp6:131273.Seq
M00004249D:F10		RTA00000193AF.c.21.1.Seq_THC222602
M00004249D:F10		RTA00000193AF.c.21.1
M00004275C:C11	16914	99.A9.sp6:131238.Seq
M00004275C:C11	16914	RTA00000193AF.f.5.1
M00004283B:A04	14286	RTA00000193AF.f.22.1
M00004285B:E08	56020	RTA00000193AF.g.2.1
M00004327B:H04		RTA00000193AF.j.20.1
M00004377C:F05	2102	RTA00000193AF.n.7.1
M00004384C:D02		RTA00000193AF.n.15.1
M00004384C:D02		RTA00000193AF.n.15.1.Seq_THC215687
M00004461A:B08		RTA00000194AR.a.10.2
M00004461A:B09		RTA00000194AF.a.11.1
M00004691D:A05		RTA00000194AF.c.23.1
M00004896A:C07		RTA00000194AF.d.13.1

- The above material has been deposited with the American Type Culture Collection, Rockville, Maryland, under the accession number indicated. This deposit will be maintained
- 5 under the terms of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for purposes of Patent Procedure. The deposit will be maintained for a period of 30 years following issuance of this patent, or for the enforceable life of the patent, whichever is greater. Upon issuance of the patent, the deposit will be available to the public from the ATCC without restriction.
- 10 This deposit is provided merely as convenience to those of skill in the art, and is not an admission that a deposit is required under 35 U.S.C. §112. The sequence of the polynucleotides contained within the deposited material, as well as the amino acid sequence of the polypeptides encoded thereby, are incorporated herein by reference and are controlling in the event of any conflict with the written description of sequences herein. A license may

be required to make, use, or sell the deposited material, and no such license is granted hereby.

Retrieval of Individual Clones from Deposit of Pooled Clones

5 Where the ATCC deposit is composed of a pool of cDNA clones, the deposit was prepared by first transfecting each of the clones into separate bacterial cells. The clones were then deposited as a pool of equal mixtures in the composite deposit. Particular clones can be obtained from the composite deposit using methods well known in the art. For example, a bacterial cell containing a particular clone can be identified by isolating single
10 colonies, and identifying colonies containing the specific clone through standard colony hybridization techniques, using an oligonucleotide probe or probes designed to specifically hybridize to a sequence of the clone insert (*e.g.*, a probe based upon unmasked sequence of the encoded polynucleotide having the indicated SEQ ID NO). The probe should be designed to have a T_m of approximately 80°C (assuming 2°C for each A or T and 4°C for
15 each G or C). Positive colonies can then be picked, grown in culture, and the recombinant clone isolated. Alternatively, probes designed in this manner can be used to PCR to isolate a nucleic acid molecule from the pooled clones according to methods well known in the art, *e.g.*, by purifying the cDNA from the deposited culture pool, and using the probes in PCR reactions to produce an amplified product having the corresponding desired polynucleotide
20 sequence.

Table 1. Sequence identification numbers, cluster ID, sequence name, and clone name

SEQ ID NO:	Cluster ID	Sequence Name	Clone Name
1	4635	RTA00000180AF.i.20.1	M00001429B:A11
2		RTA00000185AF.n.12.1	M00001608D:A11
3	4622	RTA00000187AF.m.15.2	M00001686A:E06
4	3706	RTA00000191AF.i.17.2	M00004068B:A01
5	36535	RTA00000181AF.f.5.1	M00001449A:G10
6	3990	RTA00000183AF.j.11.1	M00001532B:A06
7	5319	RTA00000192AF.i.12.1	M00004169C:C12
8	36393	RTA00000180AF.c.2.1	M00001417A:E02
9	2623	RTA00000183AF.a.6.1	M00001497A:G02
10	7587	RTA00000178AF.n.24.1	M00001387B:G03
11	7065	RTA00000137A.g.6.1	M00001557A:D02
12	10539	RTA00000187AF.l.7.1	M00001680D:F08
13	27250	RTA00000181AF.g.10.1	M00001450A:D08
14	5556	RTA00000179AF.n.10.1	M00001407B:D11
15		RTA00000192AF.m.12.1	M00004191D:B11
16	8761	RTA00000184AF.k.12.1	M00001557D:D09
17	4622	RTA00000189AF.g.1.1	M00003856B:C02
18	11460	RTA00000187AF.g.12.1	M00001676B:F05
19	16283	RTA00000120A.o.20.1	M00001467A:D08
20	3430	RTA00000191AF.a.9.1	M00003981A:E10
21	7065	RTA00000184AF.j.21.1	M00001557A:D02
22		RTA00000182AF.l.20.1	M00001488B:F12
23		RTA00000123A.g.19.1	M00001531A:H11
24	16918	RTA00000193AF.a.16.1	M00004223A:G10
25	16914	RTA00000193AF.f.5.1	M00004275C:C11
26	40108	RTA00000187AF.o.24.1	M00003741D:C09
27	14286	RTA00000193AF.f.22.1	M00004283B:A04
28	17004	RTA00000186AF.b.21.1	M00001617C:E02
29		RTA00000180AF.g.22.1	M00001426B:D12
30	13272	RTA00000192AF.e.3.1	M00004138B:H02
31		RTA00000194AF.f.4.1	M00005180C:G03
32	32663	RTA00000118A.l.8.1	M00001450A:A11
33		RTA00000180AF.a.9.1	M00001414A:B01
34	5832	RTA00000178AF.o.23.1	M00001388D:G05
35	7801	RTA00000181AF.c.21.1	M00001446A:F05
36	76760	RTA00000187AF.a.15.1	M00001657D:F08
37	40132	RTA00000178AF.c.7.1	M00001365C:C10
38		RTA00000183AF.e.1.1	M00001505C:C05
39	4016	RTA00000118A.c.4.1	M00001395A:C03
40	5382	RTA00000187AF.m.23.2	M00001688C:F09

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SEQ ID NO:	Cluster ID	Sequence Name	Clone Name
41	5693	RTA00000190AF.p.17.2	M00003978B:G05
42	307	RTA00000136A.o.4.2	M00001552A:B12
43	39833	RTA00000178AF.i.23.1	M00001378B:B02
44		RTA00000193AF.m.5.1	M00004359B:G02
45	5325	RTA00000191AF.o.6.1	M00004093D:B12
46	5325	RTA00000191AF.o.6.2	M00004093D:B12
47	18957	RTA00000190AR.m.9.1	M00003958A:H02
48	39508	RTA00000120A.o.2.1	M00001467A:D04
49	22390	RTA00000136A.j.13.1	M00001551A:G06
50	12170	RTA00000125A.h.18.4	M00001544A:E03
51	4393	RTA00000187AF.n.17.1	M00001693C:G01
52	19	RTA00000182AF.b.7.1	M00001463C:B11
53		RTA00000193AF.c.21.1	M00004249D:F10
54	7899	RTA00000189AF.c.10.1	M00003837D:A01
55	40073	RTA00000191AF.e.3.1	M00004028D:C05
56	7005	RTA00000179AF.o.22.1	M00001410A:D07
57		RTA00000187AF.h.22.1	M00001679A:F06
58	18957	RTA00000190AF.m.9.2	M00003958A:H02
59	18957	RTA00000183AF.h.23.1	M00001528A:F09
60	16283	RTA00000182AF.c.22.1	M00001467A:D08
61	6974	RTA00000183AF.d.9.1	M00001504C:H06
62	2623	RTA00000183AF.b.14.1	M00001500A:E11
63	9105	RTA00000191AF.a.21.2	M00003983A:A05
64	13238	RTA00000181AF.m.4.1	M00001455A:E09
65	5749	RTA00000185AF.a.19.1	M00001571C:H06
66	6455	RTA00000193AF.b.9.1	M00004229B:F08
67	23001	RTA00000185AF.c.24.1	M00001578B:E04
68	6455	RTA00000192AF.g.23.1	M00004157C:A09
69	13595	RTA00000189AF.f.8.1	M00003851B:D10
70	39442	RTA00000120A.o.21.1	M00001467A:E10
71	17036	RTA00000191AF.f.13.1	M00004035D:B06
72		RTA00000183AF.g.9.1	M00001513B:G03
73	7005	RTA00000181AF.k.24.1	M00001454B:C12
74	6268	RTA00000126A.o.23.1	M00001551A:B10
75	16130	RTA00000119A.c.13.1	M00001453A:E11
76	23201	RTA00000187AF.a.14.1	M00001657D:C03
77	5321	RTA00000183AF.k.8.1	M00001534A:F09
78	13157	RTA00000186AF.a.6.1	M00001614C:F10
79	2102	RTA00000193AF.n.7.1	M00004377C:F05
80	1058	RTA00000126A.e.20.3	M00001548A:H09
81	40392	RTA00000180AF.j.8.1	M00001429D:D07
82		RTA00000183AF.e.23.1	M00001506D:A09
83	11476	RTA00000187AF.p.19.1	M00003747D:C05

SEQ ID NO:	Cluster ID	Sequence Name	Clone Name
84	3584	RTA00000177AF.h.20.1	M00001349B:B08
85	10470	RTA00000180AF.f.18.1	M00001424B:G09
86	39425	RTA00000133A.f.1.1	M00001470A:C04
87	5175	RTA00000184AF.f.3.1	M00001550A:G01
88	13576	RTA00000189AF.o.13.1	M00003885C:A02
89	7665	RTA00000134A.l.19.1	M00001535A:B01
90	16927	RTA00000177AF.h.9.3	M00001348B:B04
91	6660	RTA00000187AF.h.15.1	M00001679A:A06
92	2433	RTA00000191AF.a.15.2	M00003982C:C02
93	5097	RTA00000134A.k.1.1	M00001534A:D09
94	21847	RTA00000193AF.j.9.1	M00004318C:D10
95	3277	RTA00000138A.l.5.1	M00001624A:B06
96	5708	RTA00000184AF.g.12.1	M00001552B:D04
97	945	RTA00000178AR.a.20.1	M00001362C:H11
98	16269	RTA00000178AF.p.1.1	M00001389A:C08
99		RTA00000183AF.c.24.1	M00001504A:E01
100	16731	RTA00000181AF.a.20.1	M00001442C:D07
101	12439	RTA00000190AF.o.24.1	M00003975A:G11
102	3162	RTA00000177AF.j.12.3	M00001351B:A08
103		RTA00000194AF.b.19.1	M00004505D:F08
104		RTA00000193AF.n.15.1	M00004384C:D02
105		RTA00000186AF.n.7.1	M00001651A:H01
106	10717	RTA00000181AF.d.10.1	M00001447A:G03
107	4573	RTA00000189AF.j.12.1	M00003871C:E02
108		RTA00000186AF.h.14.1	M00001632D:H07
109	11443	RTA00000192AF.l.13.2	M00004185C:C03
110	5892	RTA00000184AF.d.11.1	M00001548A:E10
111	3162	RTA00000177AF.j.12.1	M00001351B:A08
112	10470	RTA00000185AF.k.6.1	M00001597D:C05
113	17055	RTA00000187AF.m.3.1	M00001682C:B12
114	2030	RTA00000193AF.m.20.1	M00004372A:A03
115	6558	RTA00000184AF.m.21.1	M00001560D:F10
116	23255	RTA00000190AF.j.4.1	M00003922A:E06
117	9577	RTA00000179AF.o.17.1	M00001409C:D12
118		RTA00000180AF.a.11.1	M00001414C:A07
119	8	RTA00000181AF.e.17.1	M00001448D:C09
120	67907	RTA00000188AF.g.11.1	M00003774C:A03
121	12081	RTA00000133A.d.14.2	M00001469A:C10
122	2448	RTA00000119A.j.21.1	M00001460A:F06
123	3389	RTA00000189AF.g.3.1	M00003857A:G10
124	39174	RTA00000124A.n.13.1	M00001541A:H03
125	24488	RTA00000190AF.n.16.1	M00003968B:F06
126	8210	RTA00000192AF.n.13.1	M00004197D:H01

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SEQ ID NO:	Cluster ID	Sequence Name	Clone Name
127		RTA00000135A.l.2.2	M00001545A:B02
128	40455	RTA00000190AF.m.10.2	M00003958C:G10
129	9577	RTA00000180AF.d.23.1	M00001421C:F01
130	13183	RTA00000192AF.a.24.1	M00004114C:F11
131	5214	RTA00000186AF.g.11.1	M00001630B:H09
132	67252	RTA00000187AF.o.6.1	M00001716D:H05
133	3108	RTA00000188AF.d.24.1	M00003763A:F06
134	2464	RTA00000178AF.n.18.1	M00001387A:C05
135	36313	RTA00000181AF.e.23.1	M00001448D:H01
136	23255	RTA00000177AF.e.14.3	M00001343D:H07
137	7985	RTA00000182AR.j.2.1	M00001481D:A05
138	8286	RTA00000183AF.o.1.1	M00001540A:D06
139	22195	RTA00000180AF.g.7.1	M00001425B:H08
140	4573	RTA00000184AF.h.9.1	M00001553B:F12
141	26875	RTA00000187AF.i.1.1	M00001679A:F10
142	7187	RTA00000177AF.i.8.2	M00001350A:H01
143	86859	RTA00000118A.p.8.1	M00001452A:B12
144	4623	RTA00000185AF.f.4.1	M00001586C:C05
145		RTA00000121A.c.10.1	M00001469A:A01
146	10185	RTA00000183AF.d.5.1	M00001504C:A07
147		RTA00000183AF.p.4.1	M00001542B:B01
148	15069	RTA00000191AF.l.6.1	M00004081C:D10
149	39304	RTA00000118A.j.21.1	M00001450A:A02
150	8672	RTA00000190AF.f.11.1	M00003909D:C03
151	13576	RTA00000177AF.g.16.1	M00001347A:B10
152	6293	RTA00000185AF.e.11.1	M00001583D:A10
153	16977	RTA00000192AF.g.3.1	M00004151D:B08
154	5345	RTA00000189AF.l.19.1	M00003879B:C11
155	4905	RTA00000193AF.e.14.1	M00004269D:D06
156	17036	RTA00000191AF.j.10.1	M00004072B:B05
157	5417	RTA00000191AF.h.19.1	M00004059A:D06
158	7172	RTA00000178AF.f.9.1	M00001371C:E09
159	40044	RTA00000186AF.d.1.1	M00001621C:C08
160	4386	RTA00000184AF.j.4.1	M00001556B:C08
161	40044	RTA00000183AF.g.22.1	M00001514C:D11
162	9685	RTA00000183AF.c.11.1	M00001501D:C02
163	22155	RTA00000185AF.n.9.1	M00001608B:E03
164	10515	RTA00000189AF.f.18.1	M00003853A:F12
165	6539	RTA00000185AF.d.11.1	M00001579D:C03
166	15066	RTA00000180AF.e.24.1	M00001423B:E07
167	4261	RTA00000180AF.h.5.1	M00001426D:C08
168	13864	RTA00000125A.m.9.1	M00001545A:D08
169	6539	RTA00000189AF.d.22.1	M00003844C:B11

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SEQ ID NO:	Cluster ID	Sequence Name	Clone Name
170	11465	RTA00000185AF.m.19.1	M00001607A:E11
171	3266	RTA00000184AR.g.1.1	M00001551C:G09
172	102	RTA00000184AF.o.5.1	M00001563B:F06
173	16970	RTA00000181AR.i.18.2	M00001452C:B06
174	12971	RTA00000193AF.a.20.1	M00004223D:E04
175	5007	RTA00000177AF.g.2.1	M00001346A:F09
176	3765	RTA00000135A.d.1.1	M00001541A:D02
177	11294	RTA00000184AF.j.6.1	M00001556B:G02
178	3681	RTA00000131A.g.15.2	M00001449A:D12
179	9283	RTA00000181AR.m.21.2	M00001455D:F09
180	18699	RTA00000182AF.m.16.1	M00001490B:C04
181	86110	RTA00000181AF.f.12.1	M00001449C:D06
182	39648	RTA00000178AR.l.8.2	M00001383A:C03
183	7337	RTA00000123A.b.17.1	M00001528A:C04
184	1334	RTA00000178AF.j.7.1	M00001379A:A05
185	17076	RTA00000188AF.d.21.1	M00003762C:B08
186	22794	RTA00000138A.b.5.1	M00001601A:D08
187	39171	RTA00000186AF.l.7.1	M00001644C:B07
188	8551	RTA00000179AF.p.21.1	M00001412B:B10
189	5857	RTA00000118A.g.14.1	M00001449A:A12
190	9443	RTA00000183AF.c.1.1	M00001500C:E04
191	9457	RTA00000193AF.i.14.2	M00004307C:A06
192	7206	RTA00000182AF.o.15.1	M00001494D:F06
193	22979	RTA00000178AF.k.22.1	M00001382C:A02
194	40455	RTA00000190AR.m.10.1	M00003958C:G10
195	7221	RTA00000191AF.p.9.1	M00004105C:A04
196		RTA00000191AF.j.9.1	M00004072A:C03
197	7239	RTA00000126A.m.4.2	M00001550A:A03
198	31587	RTA00000189AF.l.20.1	M00003879B:D10
199	16317	RTA00000190AF.e.6.1	M00003907D:H04
200	13576	RTA00000189AR.o.13.1	M00003885C:A02
201	5779	RTA00000177AF.g.14.3	M00001346D:G06
202	6124	RTA00000191AR.e.2.3	M00004028D:A06
203	9952	RTA00000180AF.c.20.1	M00001418B:F03
204		RTA00000188AF.i.8.1	M00003784D:D12
205	5779	RTA00000177AF.g.14.1	M00001346D:G06
206	39490	RTA00000128A.b.4.1	M00001557A:F03
207	4416	RTA00000187AF.h.13.1	M00001678D:F12
208	4009	RTA00000179AF.e.20.1	M00001396A:C03
209	5336	RTA00000183AF.b.13.1	M00001500A:C05
210	39186	RTA00000121A.p.15.1	M00001512A:A09
211	40122	RTA00000190AF.n.23.1	M00003970C:B09
212	12532	RTA00000190AF.g.2.1	M00003912B:D01

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213	8078	RTA00000177AR.l.13.1	M00001353A:G12
214	3900	RTA00000190AF.g.13.1	M00003914C:F05
215	7589	RTA00000120A.p.23.1	M00001468A:F05
216	8298	RTA00000127A.d.19.1	M00001553A:H06
217	4443	RTA00000177AF.b.20.4	M00001341A:E12
218	26295	RTA00000193AF.i.24.2	M00004312A:G03
219	3389	RTA00000183AF.m.19.1	M00001537B:G07
220	7015	RTA00000187AF.f.18.1	M00001673C:H02
221	8526	RTA00000180AF.d.1.1	M00001418D:B06
222	4665	RTA00000186AF.m.3.1	M00001648C:A01
223	1399	RTA00000129A.o.10.1	M00001604A:B10
224	9244	RTA00000127A.l.3.1	M00001556A:C09
225		RTA00000179AF.j.13.1	M00001400B:H06
226	82498	RTA00000118A.m.10.1	M00001450A:B12
227	35702	RTA00000187AR.c.15.2	M00001663A:E04
228	38759	RTA00000120A.m.12.3	M00001467A:B07
229	39648	RTA00000178AF.l.8.1	M00001383A:C03
230	19105	RTA00000133A.e.15.1	M00001469A:H12
231	85064	RTA00000131A.m.23.1	M00001452A:F05
232	9285	RTA00000191AF.m.18.1	M00004086D:G06
233	9285	RTA00000190AF.d.7.1	M00003906C:E10
234	39391	RTA00000138A.c.3.1	M00001604A:F05
235		RTA00000178AF.d.20.1	M00001368D:E03
236	39498	RTA00000119A.j.20.1	M00001460A:F12
237	7798	RTA00000189AF.k.12.1	M00003876D:E12
238	7798	RTA00000189AF.c.18.1	M00003839A:D08
239	19829	RTA00000125A.h.24.4	M00001544A:G02
240		RTA00000188AF.d.11.1	M00003761D:A09
241	4275	RTA00000120A.j.14.1	M00001466A:E07
242	22113	RTA00000125A.c.7.1	M00001542A:A09
243	40314	RTA00000186AF.c.15.1	M00001619C:F12
244	10944	RTA00000126A.h.17.2	M00001549A:D08
245	39809	RTA00000190AF.e.3.1	M00003907D:A09
246	22085	RTA00000135A.e.5.2	M00001541A:F07
247	19255	RTA00000135A.m.18.1	M00001545A:C03
248	14311	RTA00000192AF.o.2.1	M00004203B:C12
249	8479	RTA00000189AF.j.22.1	M00003875C:G07
250		RTA00000189AF.j.23.1	M00003875D:D11
251	4193	RTA00000184AF.e.13.1	M00001549B:F06
252	22814	RTA00000184AF.h.14.1	M00001553D:D10
253	39563	RTA00000179AF.k.20.1	M00001402A:E08
254	39420	RTA00000134A.o.23.1	M00001537A:F12
255	11589	RTA00000177AF.b.17.4	M00001340D:F10

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256	4937	RTA00000191AF.p.21.1	M00004108A:E06
257	39412	RTA00000133A.k.17.1	M00001511A:H06
258	4837	RTA00000185AR.k.3.2	M00001597C:H02
259	13046	RTA00000193AF.h.19.1	M00004296C:H07
260	4141	RTA00000177AF.p.20.3	M00001361A:A05
261	38085	RTA00000123A.e.15.1	M00001531A:D01
262		RTA00000189AF.p.8.1	M00003891C:H09
263	11451	RTA00000192AF.p.17.1	M00004214C:H05
264	14507	RTA00000189AR.l.23.2	M00003879D:A02
265	40054	RTA00000180AF.p.10.1	M00001439C:F08
266	39423	RTA00000134A.k.22.1	M00001535A:F10
267	39453	RTA00000135A.g.11.1	M00001542A:E06
268	10751	RTA00000187AF.k.7.1	M00001679D:D03
269	10751	RTA00000187AF.k.6.1	M00001679D:D03
270	78091	RTA00000187AF.j.6.1	M00001679C:F01
271	39539	RTA00000127A.i.21.1	M00001555A:B02
272		RTA00000182AF.l.15.1	M00001487B:H06
273		RTA00000194AF.d.13.1	M00004896A:C07
274		RTA00000128A.c.20.1	M00001558A:H05
275	9283	RTA00000181AR.m.22.2	M00001455D:F09
276	39168	RTA00000121A.l.10.1	M00001507A:H05
277	39458	RTA00000126A.p.15.2	M00001552A:D11
278	14391	RTA00000177AF.m.17.3	M00001355B:G10
279	39195	RTA00000137A.c.16.1	M00001555A:C01
280	7212	RTA00000193AF.b.14.1	M00004230B:C07
281	4015	RTA00000136A.e.12.1	M00001549A:B02
282	12977	RTA00000189AF.j.19.1	M00003875B:F04
283		RTA00000178AF.m.13.1	M00001384B:A11
284	14391	RTA00000191AF.l.7.1	M00004081C:D12
285		RTA00000194AF.c.23.1	M00004691D:A05
286		RTA00000181AF.b.7.1	M00001443B:F01
287	8358	RTA00000183AF.i.5.1	M00001528B:H04
288	1267	RTA00000125A.o.5.1	M00001546A:G11
289		RTA00000189AF.f.7.1	M00003851B:D08
290	16347	RTA00000184AF.e.15.1	M00001549C:E06
291	7899	RTA00000193AF.a.17.1	M00004223B:D09
292	2379	RTA00000178AF.a.6.1	M00001361D:F08
293	39478	RTA00000133A.i.5.1	M00001471A:B01
294	39392	RTA00000134A.m.16.1	M00001536A:C08
295	5053	RTA00000184AF.o.12.1	M00001564A:B12
296	16999	RTA00000185AF.k.9.1	M00001598A:G03
297	39180	RTA00000126A.n.8.2	M00001551A:F05
298	1037	RTA00000121A.f.8.1	M00001470A:B10

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SEQ ID NO:	Cluster ID	Sequence Name	Clone Name
299	6867	RTA00000178AF.e.12.1	M00001370A:C09
300	10539	RTA00000183AF.a.24.1	M00001499B:A11
301	41633	RTA00000118A.g.16.1	M00001449A:B12
302	23218	RTA00000187AR.c.5.2	M00001662C:A09
303	39380	RTA00000129A.e.24.1	M00001587A:B11
304		RTA00000185AF.d.24.1	M00001582D:F05
305		RTA00000177AF.o.4.3	M00001358C:C06
306	6974	RTA00000184AF.a.15.1	M00001544B:B07
307		RTA00000185AF.g.11.1	M00001590B:F03
308	15855	RTA00000184AF.j.1.1	M00001556A:H01
309	84328	RTA00000118A.p.10.1	M00001452A:B04
310	10145	RTA00000120A.g.12.1	M00001465A:B11
311	39805	RTA00000177AF.c.21.3	M00001342B:E06
312		RTA00000187AF.h.23.1	M00001679A:F06
313	6298	RTA00000187AR.i.10.2	M00001679B:F01
314	14367	RTA00000187AF.e.8.1	M00001670C:H02
315		RTA00000193AF.c.22.1	M00004249D:G12
316	16921	RTA00000183AF.k.6.1	M00001534A:C04
317	1577	RTA00000184AF.i.23.1	M00001556A:F11
318	8773	RTA00000187AF.f.24.1	M00001675A:C09
319		RTA00000194AF.a.11.1	M00004461A:B09
320	39886	RTA00000178AF.j.24.1	M00001380D:B09
321	13532	RTA00000181AF.c.4.1	M00001445A:F05
322		RTA00000193AF.d.2.1	M00004251C:G07
323	5257	RTA00000192AF.f.3.1	M00004146C:C11
324	9061	RTA00000191AR.e.11.2	M00004031A:A12
325	19267	RTA00000186AF.l.12.1	M00001645A:C12
326	20212	RTA00000134A.l.22.1	M00001535A:C06
327	16653	RTA00000181AF.k.5.3	M00001453C:F06
328	16985	RTA00000177AF.h.10.1	M00001348B:G06
329	12977	RTA00000189AR.j.19.1	M00003875B:F04
330	9061	RTA00000191AR.e.11.3	M00004031A:A12
331		RTA00000194AR.a.10.2	M00004461A:B08
332	6468	RTA00000187AF.d.15.1	M00001669B:F02
333	16392	RTA00000192AF.l.1.1	M00004183C:D07
334	14627	RTA00000187AF.g.23.1	M00001677C:E10
335	6583	RTA00000179AF.d.13.1	M00001394A:F01
336	6806	RTA00000177AF.g.13.3	M00001346D:E03
337	9635	RTA00000137A.e.23.4	M00001557A:F01
338	689	RTA00000181AR.l.22.1	M00001454D:G03
339	4119	RTA00000183AF.k.16.1	M00001534C:A01
340	8952	RTA00000183AF.h.15.1	M00001518C:B11
341	2379	RTA00000192AF.p.8.1	M00004212B:C07

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342	39486	RTA00000128A.m.22.2	M00001561A:C05
343	21877	RTA00000189AF.b.21.1	M00003833A:E05
344	6874	RTA00000192AF.a.14.1	M00004111D:A08
345	6874	RTA00000189AF.e.9.1	M00003846B:D06
346	37285	RTA00000191AF.f.11.1	M00004035C:A07
347		RTA00000193AF.j.20.1	M00004327B:H04
348	7674	RTA00000118A.g.9.1	M00001416A:H01
349	2797	RTA00000180AF.i.19.1	M00001429A:H04
350		RTA00000184AF.g.22.1	M00001552D:A01
351	7802	RTA00000185AF.n.5.1	M00001608A:B03
352	16921	RTA00000193AF.h.15.1	M00004295D:F12
353	11494	RTA00000192AF.j.6.1	M00004172C:D08
354	17062	RTA00000177AF.b.8.4	M00001340B:A06
355	16245	RTA00000177AF.k.9.3	M00001352A:E02
356	83103	RTA00000119A.e.24.2	M00001454A:A09
357	4309	RTA00000186AF.e.22.1	M00001624C:F01
358	13072	RTA00000181AR.m.5.2	M00001455B:E12
359	4059	RTA00000177AF.n.18.3	M00001357D:D11
360	5178	RTA00000178AF.n.10.1	M00001386C:B12
361	1120	RTA00000118A.p.15.3	M00001452A:D08
362	6420	RTA00000183AF.d.11.1	M00001504D:G06
363	13913	RTA00000186AF.e.6.1	M00001623D:F10
364		RTA00000192AF.c.2.1	M00004121B:G01
365	3956	RTA00000183AF.g.3.1	M00001512D:G09
366	14364	RTA00000183AF.g.12.1	M00001513C:E08
367	6880	RTA00000191AF.m.20.1	M00004087D:A01
368	84182	RTA00000180AF.h.19.1	M00001428A:H10
369	2790	RTA00000177AF.e.2.1	M00001343C:F10
370	4561	RTA00000184AF.i.21.1	M00001555D:G10
371	8847	RTA00000180AF.b.16.1	M00001416B:H11
372	56020	RTA00000193AF.g.2.1	M00004285B:E08
373	1531	RTA00000119A.o.3.1	M00001461A:D06
374	6420	RTA00000177AF.f.10.3	M00001345A:E01
375		RTA00000188AF.b.12.1	M00003754C:E09
376		RTA00000180AF.k.24.1	M00001432C:F06
377		RTA00000184AF.a.8.1	M00001544A:E06
378	2696	RTA00000134A.m.13.1	M00001536A:B07
379	260	RTA00000185AR.i.12.2	M00001594B:H04
380	11350	RTA00000189AF.a.24.2	M00003826B:A06
381	2428	RTA00000123A.l.21.1	M00001533A:C11
382	4313	RTA00000122A.n.3.1	M00001517A:B07
383		RTA00000184AF.p.3.1	M00001566B:D11
384	697	RTA00000188AF.d.6.1	M00003759B:B09

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385	5619	RTA00000188AF.i.9.1	M00003796C:D05
386	4568	RTA00000122A.d.15.3	M00001513A:B06
387		RTA00000177AF.i.6.2	M00001350A:B08
388	5622	RTA00000178AF.a.11.1	M00001362B:D10
389	7514	RTA00000184AF.k.21.1	M00001558B:H11
390	5619	RTA00000189AF.f.17.1	M00003853A:D04
391	7570	RTA00000187AF.g.24.1	M00001677D:A07
392	23358	RTA00000190AF.o.21.1	M00003974D:H02
393	23210	RTA00000190AF.o.20.1	M00003974D:E07
394	5192	RTA00000184AF.k.2.1	M00001557B:H10
395	13538	RTA00000180AF.a.24.1	M00001415A:H06
396		RTA00000189AF.h.17.1	M00003867A:D10
397		RTA00000192AF.o.11.1	M00004205D:F06
398		RTA00000184AF.l.11.1	M00001559B:F01
399	4718	RTA00000189AF.g.5.1	M00003857A:H03
400	14929	RTA00000177AF.m.1.2	M00001353D:D10
401	4908	RTA00000192AF.j.2.1	M00004171D:B03
402		RTA00000178AF.k.16.1	M00001381D:E06
403		RTA00000194AF.c.24.1	M00004692A:H08
404	17732	RTA00000178AR.i.2.2	M00001376B:G06
405	17062	80.A1.sp6:130208.Seq	M00001340B:A06
406	11589	80.B1.sp6:130220.Seq	M00001340D:F10
407	4443	80.C1.sp6:130232.Seq	M00001341A:E12
408	39805	80.D1.sp6:130244.Seq	M00001342B:E06
409	2790	80.E1.sp6:130256.Seq	M00001343C:F10
410	23255	80.F1.sp6:130268.Seq	M00001343D:H07
411	6420	80.G1.sp6:130280.Seq	M00001345A:E01
412	5007	80.H1.sp6:130292.Seq	M00001346A:F09
413	13576	80.D2.sp6:130245.Seq	M00001347A:B10
414	16927	80.E2.sp6:130257.Seq	M00001348B:B04
415	16985	80.F2.sp6:130269.Seq	M00001348B:G06
416	3584	80.G2.sp6:130281.Seq	M00001349B:B08
417		80.H2.sp6:130293.Seq	M00001350A:B08
418	7187	80.A3.sp6:130210.Seq	M00001350A:H01
419	16245	80.D3.sp6:130246.Seq	M00001352A:E02
420	8078	80.E3.sp6:130258.Seq	M00001353A:G12
421	14929	80.F3.sp6:130270.Seq	M00001353D:D10
422	14391	80.G3.sp6:130282.Seq	M00001355B:G10
423	4141	80.B4.sp6:130223.Seq	M00001361A:A05
424	2379	80.C4.sp6:130235.Seq	M00001361D:F08
425	5622	80.D4.sp6:130247.Seq	M00001362B:D10
426	945	80.E4.sp6:130259.Seq	M00001362C:H11
427	40132	80.F4.sp6:130271.Seq	M00001365C:C10

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428		80.G4.sp6:130283.Seq	M00001368D:E03
429	6867	80.H4.sp6:130295.Seq	M00001370A:C09
430	7172	80.A5.sp6:130212.Seq	M00001371C:E09
431	17732	80.B5.sp6:130224.Seq	M00001376B:G06
432	39833	80.C5.sp6:130236.Seq	M00001378B:B02
433	1334	80.D5.sp6:130248.Seq	M00001379A:A05
434	39886	80.E5.sp6:130260.Seq	M00001380D:B09
435		80.F5.sp6:130272.Seq	M00001381D:E06
436	22979	80.G5.sp6:130284.Seq	M00001382C:A02
437	39648	80.H5.sp6:130296.Seq	M00001383A:C03
438		80.B6.sp6:130225.Seq	M00001384B:A11
439	5178	80.C6.sp6:130237.Seq	M00001386C:B12
440	2464	80.D6.sp6:130249.Seq	M00001387A:C05
441	7587	80.E6.sp6:130261.Seq	M00001387B:G03
442	5832	80.F6.sp6:130273.Seq	M00001388D:G05
443	16269	80.G6.sp6:130285.Seq	M00001389A:C08
444	6583	80.H6.sp6:130297.Seq	M00001394A:F01
445	4009	80.A7.sp6:130214.Seq	M00001396A:C03
446		80.B7.sp6:130226.Seq	M00001400B:H06
447	39563	80.C7.sp6:130238.Seq	M00001402A:E08
448	5556	80.D7.sp6:130250.Seq	M00001407B:D11
449	9577	80.E7.sp6:130262.Seq	M00001409C:D12
450	7005	80.F7.sp6:130274.Seq	M00001410A:D07
451	8551	80.G7.sp6:130286.Seq	M00001412B:B10
452		80.H7.sp6:130298.Seq	M00001414A:B01
453		80.A8.sp6:130215.Seq	M00001414C:A07
454	13538	80.B8.sp6:130227.Seq	M00001415A:H06
455	8847	80.C8.sp6:130239.Seq	M00001416B:H11
456	36393	80.D8.sp6:130251.Seq	M00001417A:E02
457	9952	80.E8.sp6:130263.Seq	M00001418B:F03
458	9577	80.G8.sp6:130287.Seq	M00001421C:F01
459	15066	80.H8.sp6:130299.Seq	M00001423B:E07
460	10470	80.A9.sp6:130216.Seq	M00001424B:G09
461	22195	80.B9.sp6:130228.Seq	M00001425B:H08
462		80.C9.sp6:130240.Seq	M00001426B:D12
463	4261	80.D9.sp6:130252.Seq	M00001426D:C08
464	84182	80.E9.sp6:130264.Seq	M00001428A:H10
465	40392	80.H9.sp6:130300.Seq	M00001429D:D07
466	16731	80.C10.sp6:130241.Seq	M00001442C:D07
467		80.D10.sp6:130253.Seq	M00001443B:F01
468	13532	80.E10.sp6:130265.Seq	M00001445A:F05
469	8	80.H10.sp6:130301.Seq	M00001448D:C09
470	36313	80.A11.sp6:130218.Seq	M00001448D:H01

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471	5857	80.B11.sp6:130230.Seq	M00001449A:A12
472	41633	80.C11.sp6:130242.Seq	M00001449A:B12
473	36535	80.D11.sp6:130254.Seq	M00001449A:G10
474	86110	80.E11.sp6:130266.Seq	M00001449C:D06
475	32663	80.F11.sp6:130278.Seq	M00001450A:A11
476	27250	80.G11.sp6:130290.Seq	M00001450A:D08
477	16970	80.H11.sp6:130302.Seq	M00001452C:B06
478	16130	80.A12.sp6:130219.Seq	M00001453A:E11
479	16653	80.B12.sp6:130231.Seq	M00001453C:F06
480	7005	80.C12.sp6:130243.Seq	M00001454B:C12
481	13072	80.F12.sp6:130279.Seq	M00001455B:E12
482	9283	80.G12.sp6:130291.Seq	M00001455D:F09
483	23255	100.C1.sp6:131446.Seq	M00001343D:H07
484	13576	100.E1.sp6:131470.Seq	M00001347A:B10
485	7187	100.C2.sp6:131447.Seq	M00001350A:H01
486	14391	100.E3.sp6:131472.Seq	M00001355B:G10
487	945	100.E4.sp6:131473.Seq	M00001362C:H11
488	7172	100.A5.sp6:131426.Seq	M00001371C:E09
489	39648	100.A6.sp6:131427.Seq	M00001383A:C03
490	84182	100.G9.sp6:131502.Seq	M00001428A:H10
491	8	100.B11.sp6:131444.Seq	M00001448D:C09
492	36535	100.D11.sp6:131468.Seq	M00001449A:G10
493	82498	100.F11.sp6:131492.Seq	M00001450A:B12
494	16970	100.C12.sp6:131457.Seq	M00001452C:B06
495	16130	100.D12.sp6:131469.Seq	M00001453A:E11
496	7005	121.D1.sp6:131917.Seq	M00001454B:C12
497		121.G6.sp6:131958.Seq	M00001506D:A09
498	18957	121.F7.sp6:131947.Seq	M00001528A:F09
499	40044	122.E1.sp6:132121.Seq	M00001621C:C08
500	5214	122.C2.sp6:132098.Seq	M00001630B:H09
501	6660	122.B5.sp6:132089.Seq	M00001679A:A06
502	13183	123.D5.sp6:132305.Seq	M00004114C:F11
503	6455	123.E7.sp6:132319.Seq	M00004157C:A09
504	5319	123.F7.sp6:132331.Seq	M00004169C:C12
505	11443	123.A8.sp6:132272.Seq	M00004185C:C03
506		123.C8.sp6:132296.Seq	M00004191D:B11
507	8210	123.E8.sp6:132320.Seq	M00004197D:H01
508	9457	123.D11.sp6:132311.Seq	M00004307C:A06
509	6420	172.E1.sp6:133925.Seq	M00001345A:E01
510	16245	172.D2.sp6:133914.Seq	M00001352A:E02
511	8078	172.C3.sp6:133903.Seq	M00001353A:G12
512	14929	172.D3.sp6:133915.Seq	M00001353D:D10
513	14391	172.H3.sp6:133963.Seq	M00001355B:G10

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516		172.B9.sp6:133897.Seq	M00001400B:H06
517		176.A3.sp6:134514.Seq	M00001632D:H07
518	19267	176.G3.sp6:134586.Seq	M00001645A:C12
519	78091	176.G5.sp6:134588.Seq	M00001679C:F01
520	17055	176.D6.sp6:134553.Seq	M00001682C:B12
521	6539	176.D9.sp6:134556.Seq	M00003844C:B11
522		177.H4.sp6:134791.Seq	M00004121B:G01
523	5257	177.F5.sp6:134768.Seq	M00004146C:C11
524	11494	177.E6.sp6:134757.Seq	M00004172C:D08
525		177.G7.sp6:134782.Seq	M00004205D:F06
526	11451	177.D8.sp6:134747.Seq	M00004214C:H05
527	9283	173.D2.SP6:134106.Seq	M00001455D:F09
528	16283	173.F3.SP6:134131.Seq	M00001467A:D08
529	10539	173.B5.SP6:134085.Seq	M00001499B:A11
530	6420	173.F5.SP6:134133.Seq	M00001504D:G06
531	3956	173.H5.SP6:134157.Seq	M00001512D:G09
532		173.G7.SP6:134147.Seq	M00001544A:E06
533	1577	173.C9.SP6:134101.Seq	M00001556A:F11
534	9635	173.D9.SP6:134113.Seq	M00001557A:F01
535	5192	173.E9.SP6:134125.Seq	M00001557B:H10
536	6539	173.A12.SP6:134080.Seq	M00001579D:C03
537	945	180.C2.sp6:135940.Seq	M00001362C:H11
538	7005	180.H5.sp6:136003.Seq	M00001410A:D07
539	39304	180.G9.sp6:135995.Seq	M00001450A:A02
540	27250	180.B10.sp6:135936.Seq	M00001450A:D08
541	35555	184.A5.sp6:135530.Seq	M00001528A:C04
542	19255	184.B10.sp6:135547.Seq	M00001545A:C03
543	6268	184.C12.sp6:135561.Seq	M00001551A:B10
544	3277	217.E1.sp6:139406.Seq	M00001624A:B06
545	39171	217.A12.sp6:139369.Seq	M00001644C:B07
546	11460	219.F2.sp6:139035.Seq	M00001676B:F05
547	10539	219.F6.sp6:139039.Seq	M00001680D:F08
548	11476	219.H8.sp6:139065.Seq	M00003747D:C05
549	4016	79.A1.sp6:130016.Seq	M00001395A:C03
550	7674	79.C1.sp6:130040.Seq	M00001416A:H01
551	3681	79.E1.sp6:130064.Seq	M00001449A:D12
552	39304	79.F1.sp6:130076.Seq	M00001450A:A02
553	82498	79.G1.sp6:130088.Seq	M00001450A:B12
554	84328	79.A2.sp6:130017.Seq	M00001452A:B04
555	86859	79.B2.sp6:130029.Seq	M00001452A:B12
556	1120	79.C2.sp6:130041.Seq	M00001452A:D08

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559	10145	79.F3.sp6:130078.Seq	M00001465A:B11
560	16283	79.H3.sp6:130102.Seq	M00001467A:D08
561	4568	79.D4.sp6:130055.Seq	M00001513A:B06
562	4313	79.F4.sp6:130079.Seq	M00001517A:B07
563	2428	79.A5.sp6:130020.Seq	M00001533A:C11
564	39423	79.C5.sp6:130044.Seq	M00001535A:F10
565	39174	79.E5.sp6:130068.Seq	M00001541A:H03
566	22113	79.F5.sp6:130080.Seq	M00001542A:A09
567	19829	79.H5.sp6:130104.Seq	M00001544A:G02
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570	4015	79.G6.sp6:130093.Seq	M00001549A:B02
571	39180	79.A7.sp6:130022.Seq	M00001551A:F05
572	307	79.C7.sp6:130046.Seq	M00001552A:B12
573	39458	79.D7.sp6:130058.Seq	M00001552A:D11
574	39490	79.G7.sp6:130094.Seq	M00001557A:F03
575	39486	79.B8.sp6:130035.Seq	M00001561A:C05
576	39380	79.E8.sp6:130071.Seq	M00001587A:B11
577	1399	79.G8.sp6:130095.Seq	M00001604A:B10
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586	16283	89.H1.sp6:130751.Seq	M00001467A:D08
587	39442	89.A2.sp6:130668.Seq	M00001467A:E10
588	7589	89.B2.sp6:130680.Seq	M00001468A:F05
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590	12081	89.D2.sp6:130704.Seq	M00001469A:C10
591	19105	89.E2.sp6:130716.Seq	M00001469A:H12
592	1037	89.F2.sp6:130728.Seq	M00001470A:B10
593	39425	89.G2.sp6:130740.Seq	M00001470A:C04
594	39478	89.H2.sp6:130752.Seq	M00001471A:B01
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597	18699	89.D3.sp6:130705.Seq	M00001490B:C04
598	7206	89.E3.sp6:130717.Seq	M00001494D:F06
599	2623	89.F3.sp6:130729.Seq	M00001497A:G02

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603	9443	89.B4.sp6:130682.Seq	M00001500C:E04
604	9685	89.C4.sp6:130694.Seq	M00001501D:C02
605		89.D4.sp6:130706.Seq	M00001504A:E01
606	10185	89.E4.sp6:130718.Seq	M00001504C:A07
607	6974	89.F4.sp6:130730.Seq	M00001504C:H06
608	6420	89.G4.sp6:130742.Seq	M00001504D:G06
609		89.H4.sp6:130754.Seq	M00001505C:C05
610		89.A5.sp6:130671.Seq	M00001506D:A09
611	39168	89.B5.sp6:130683.Seq	M00001507A:H05
612	39412	89.C5.sp6:130695.Seq	M00001511A:H06
613	39186	89.D5.sp6:130707.Seq	M00001512A:A09
614	3956	89.E5.sp6:130719.Seq	M00001512D:G09
615		89.F5.sp6:130731.Seq	M00001513B:G03
616	14364	89.G5.sp6:130743.Seq	M00001513C:E08
617	40044	89.H5.sp6:130755.Seq	M00001514C:D11
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621	8358	89.D6.sp6:130708.Seq	M00001528B:H04
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630	39392	89.G7.sp6:130745.Seq	M00001536A:C08
631	39420	89.H7.sp6:130757.Seq	M00001537A:F12
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633	8286	89.B8.sp6:130686.Seq	M00001540A:D06
634	3765	89.C8.sp6:130698.Seq	M00001541A:D02
635	39453	89.E8.sp6:130722.Seq	M00001542A:E06
636		89.F8.sp6:130734.Seq	M00001542B:B01
637		89.H8.sp6:130758.Seq	M00001544A:E06
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639		89.B9.sp6:130687.Seq	M00001545A:B02
640	19255	89.C9.sp6:130699.Seq	M00001545A:C03
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647	22390	89.C10.sp6:130700.Seq	M00001551A:G06
648	3266	89.D10.sp6:130712.Seq	M00001551C:G09
649	5708	89.E10.sp6:130724.Seq	M00001552B:D04
650		89.F10.sp6:130736.Seq	M00001552D:A01
651	8298	89.G10.sp6:130748.Seq	M00001553A:H06
652	4573	89.H10.sp6:130760.Seq	M00001553B:F12
653	22814	89.A11.sp6:130677.Seq	M00001553D:D10
654	39539	89.B11.sp6:130689.Seq	M00001555A:B02
655	39195	89.C11.sp6:130701.Seq	M00001555A:C01
656	4561	89.D11.sp6:130713.Seq	M00001555D:G10
657	9244	89.E11.sp6:130725.Seq	M00001556A:C09
658	1577	89.F11.sp6:130737.Seq	M00001556A:F11
659	4386	89.H11.sp6:130761.Seq	M00001556B:C08
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661	5192	89.D12.sp6:130714.Seq	M00001557B:H10
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670	6539	90.G1.sp6:130931.Seq	M00001579D:C03
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674	4837	90.E2.sp6:130908.Seq	M00001597C:H02
675	10470	90.F2.sp6:130920.Seq	M00001597D:C05
676	16999	90.G2.sp6:130932.Seq	M00001598A:G03
677	22794	90.H2.sp6:130944.Seq	M00001601A:D08
678	11465	90.A3.sp6:130861.Seq	M00001607A:E11
679	7802	90.B3.sp6:130873.Seq	M00001608A:B03
680	22155	90.C3.sp6:130885.Seq	M00001608B:E03
681		90.D3.sp6:130897.Seq	M00001608D:A11
682	13157	90.E3.sp6:130909.Seq	M00001614C:F10
683	17004	90.F3.sp6:130921.Seq	M00001617C:E02
684	40314	90.G3.sp6:130933.Seq	M00001619C:F12
685	40044	90.H3.sp6:130945.Seq	M00001621C:C08

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689	5214	90.D4.sp6:130898.Seq	M00001630B:H09
690		90.E4.sp6:130910.Seq	M00001632D:H07
691	39171	90.F4.sp6:130922.Seq	M00001644C:B07
692	19267	90.G4.sp6:130934.Seq	M00001645A:C12
693	4665	90.H4.sp6:130946.Seq	M00001648C:A01
694		90.A5.sp6:130863.Seq	M00001651A:H01
695	23201	90.B5.sp6:130875.Seq	M00001657D:C03
696	76760	90.C5.sp6:130887.Seq	M00001657D:F08
697	23218	90.D5.sp6:130899.Seq	M00001662C:A09
698	35702	90.E5.sp6:130911.Seq	M00001663A:E04
699	6468	90.F5.sp6:130923.Seq	M00001669B:F02
700	14367	90.G5.sp6:130935.Seq	M00001670C:H02
701	7015	90.H5.sp6:130947.Seq	M00001673C:H02
702	8773	90.A6.sp6:130864.Seq	M00001675A:C09
703	11460	90.B6.sp6:130876.Seq	M00001676B:F05
704	7570	90.D6.sp6:130900.Seq	M00001677D:A07
705	4416	90.E6.sp6:130912.Seq	M00001678D:F12
706	6660	90.F6.sp6:130924.Seq	M00001679A:A06
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710	78091	90.C7.sp6:130889.Seq	M00001679C:F01
711	10751	90.D7.sp6:130901.Seq	M00001679D:D03
712	10539	90.F7.sp6:130925.Seq	M00001680D:F08
713	17055	90.G7.sp6:130937.Seq	M00001682C:B12
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716	67252	90.C8.sp6:130890.Seq	M00001716D:H05
717	40108	90.D8.sp6:130902.Seq	M00003741D:C09
718	11476	90.E8.sp6:130914.Seq	M00003747D:C05
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720	697	90.G8.sp6:130938.Seq	M00003759B:B09
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733	5619	90.F10.sp6:130928.Seq	M00003853A:D04
734	10515	90.G10.sp6:130940.Seq	M00003853A:F12
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753	3900	99.E1.sp6:131278.Seq	M00003914C:F05
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755	24488	99.C2.sp6:131255.Seq	M00003968B:F06
756	40122	99.D2.sp6:131267.Seq	M00003970C:B09
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761	9105	99.C3.sp6:131256.Seq	M00003983A:A05
762	6124	99.D3.sp6:131268.Seq	M00004028D:A06
763	40073	99.E3.sp6:131280.Seq	M00004028D:C05
764	37285	99.H3.sp6:131316.Seq	M00004035C:A07
765	17036	99.A4.sp6:131233.Seq	M00004035D:B06
766	3706	99.C4.sp6:131257.Seq	M00004068B:A01
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768	15069	99.F4.sp6:131293.Seq	M00004081C:D10
769	9285	99.H4.sp6:131317.Seq	M00004086D:G06
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774	6874	99.F5.sp6:131294.Seq	M00004111D:A08
775	13183	99.G5.sp6:131306.Seq	M00004114C:F11
776		99.H5.sp6:131318.Seq	M00004121B:G01
777	13272	99.A6.sp6:131235.Seq	M00004138B:H02
778	5257	99.B6.sp6:131247.Seq	M00004146C:C11
779	6455	99.D6.sp6:131271.Seq	M00004157C:A09
780	5319	99.E6.sp6:131283.Seq	M00004169C:C12
781	4908	99.F6.sp6:131295.Seq	M00004171D:B03
782	11494	99.G6.sp6:131307.Seq	M00004172C:D08
783	11443	99.A7.sp6:131236.Seq	M00004185C:C03
784		99.B7.sp6:131248.Seq	M00004191D:B11
785	8210	99.C7.sp6:131260.Seq	M00004197D:H01
786	14311	99.D7.sp6:131272.Seq	M00004203B:C12
787		99.E7.sp6:131284.Seq	M00004205D:F06
788	12971	99.B8.sp6:131249.Seq	M00004223D:E04
789	6455	99.C8.sp6:131261.Seq	M00004229B:F08
790	7212	99.D8.sp6:131273.Seq	M00004230B:C07
791	4905	99.H8.sp6:131321.Seq	M00004269D:D06
792	16914	99.A9.sp6:131238.Seq	M00004275C:C11
793	16921	99.D9.sp6:131274.Seq	M00004295D:F12
794	13046	99.E9.sp6:131286.Seq	M00004296C:H07
795	9457	99.F9.sp6:131298.Seq	M00004307C:A06
796	26295	99.G9.sp6:131310.Seq	M00004312A:G03
797	21847	99.H9.sp6:131322.Seq	M00004318C:D10
798		99.H10.sp6:131323.Seq	M00004505D:F08
799		99.B11.sp6:131252.Seq	M00004692A:H08
800		99.D11.sp6:131276.Seq	M00005180C:G03
801	39304	RTA00000118A.j.21.1.Seq_THC151859	
802	2428	RTA00000123A.l.21.1.Seq_THC205063	
803	1058	RTA00000126A.e.20.3.Seq_THC217534	
804	5097	RTA00000134A.k.1.1.Seq_THC215869	
805	20212	RTA00000134A.l.22.1.Seq_THC128232	
806	23255	RTA00000177AF.e.14.3.Seq_THC228776	
807	2790	RTA00000177AF.e.2.1.Seq_THC229461	
808	6420	RTA00000177AF.f.10.3.Seq_THC226443	
809	4059	RTA00000177AF.n.18.3.Seq_THC123051	
810		RTA00000179AF.j.13.1.Seq_THC105720	
811	9952	RTA00000180AF.c.20.1.Seq_THC162284	
812	13238	RTA00000181AF.m.4.1.Seq_THC140691	
813	9685	RTA00000183AF.c.11.1.Seq_THC109544	
814		RTA00000183AF.c.24.1.Seq_THC125912	

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SEQ ID NO:	Cluster ID	Sequence Name	Clone Name
815	6420	RTA00000183AF.d.11.1.Seq_THC226443	
816	6974	RTA00000183AF.d.9.1.Seq_THC223129	
817	40044	RTA00000183AF.g.22.1.Seq_THC232899	
818		RTA00000183AF.g.9.1.Seq_THC198280	
819	5892	RTA00000184AF.d.11.1.Seq_THC161896	
820	40044	RTA00000186AF.d.1.1.1.Seq_THC232899	
821		RTA00000186AF.h.14.1.Seq_THC112525	
822	19267	RTA00000186AF.l.12.1.Seq_THC178183	
823	8773	RTA00000187AF.f.24.1.Seq_THC220002	
824	7570	RTA00000187AF.g.24.1.Seq_THC168636	
825	11476	RTA00000187AF.p.19.1.Seq_THC108482	
826		RTA00000188AF.d.11.1.Seq_THC212094	
827	17076	RTA00000188AF.d.21.1.Seq_THC208760	
828	697	RTA00000188AF.d.6.1.Seq_THC178884	
829	67907	RTA00000188AF.g.11.1.Seq_THC123222	
830	5619	RTA00000188AF.l.9.1.Seq_THC167845	
831	4718	RTA00000189AF.g.5.1.Seq_THC196102	
832	39809	RTA00000190AF.e.3.1.Seq_THC150217	
833	23255	RTA00000190AF.j.4.1.Seq_THC228776	
834	40122	RTA00000190AF.n.23.1.Seq_THC109227	
835	23210	RTA00000190AF.o.20.1.Seq_THC207240	
836	23358	RTA00000190AF.o.21.1.Seq_THC207240	
837	5693	RTA00000190AF.p.17.2.Seq_THC173318	
838	2433	RTA00000191AF.a.15.2.Seq_THC79498	
839	5257	RTA00000192AF.f.3.1.Seq_THC213833	
840	16392	RTA00000192AF.l.1.1.Seq_THC202071	
841		RTA00000193AF.c.21.1.Seq_THC222602	
842	26295	RTA00000193AF.i.24.2.Seq_THC197345	
843		RTA00000193AF.m.5.1.Seq_THC173318	
844		RTA00000193AF.n.15.1.Seq_THC215687	

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
1	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>
2	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>
3	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>
4	<NONE>	<NONE>	<NONE>	BAR3_CHITE	BALBIANI RING PROTEIN 3 PRECURSOR>PIR2:S08167 Balbiani ring 3 protein - midge (Chironomus tentans)>GP:CTBR3_1 C;tentans balbiani ring 3 (BR3) gene	1
5	<NONE>	<NONE>	<NONE>	CYAA_PODAN	ADENYLATE CYCLASE (EC 4.6.1.1) (ATP PYROPHOSPHATE-LYASE) (ADENYLYL CYCLASE)>PIR2:JC4747 adenylate cyclase (EC 4.6.1.1) - Podospora anserina>GP:PANADCY_1 Podospora anserina adenyl cyclase gene, exons 1-4	1
6	<NONE>	<NONE>	<NONE>	VP03_HSVSA	PROBABLE MEMBRANE ANTIGEN 3 (TEGUMENT PROTEIN)>PIR2:C36806 hypothetical protein ORF3 - saimiriine herpesvirus 1 (strain 11)>GP:HSGEND_3 Herpesvirus saimiri complete genome DNA; ORF 03; similarity to ORF 75 and EBV BNRF1	0.97

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
7	<NONE>	<NONE>	<NONE>	ATFCA2_18	Arabidopsis thaliana DNA chromosome 4, ESSA 1 contig fragment No; 2; Hydroxyproline-rich glycoprotein homolog; Similarity to hydroxyproline-rich glycoprotein precursor-common tobacco	0.93
8	<NONE>	<NONE>	<NONE>	DHAL_ASPN G	ALDEHYDE DEHYDROGENASE (EC 1.2.1.3) (ALDDH)>GP:ASNA LDAA_1 Aspergillus niger aldehyde dehydrogenase (aldA) gene, complete cds	0.9
9	<NONE>	<NONE>	<NONE>	NCU50264_1	Neurospora crassa two-component histidine kinase (nik-1) gene, 5' region and partial cds	0.86
10	<NONE>	<NONE>	<NONE>	NEUG_BOVI N	NEUROGRANIN (P17) (B-50 IMMUNOREACTIVE C-KINASE SUBSTRATE) (BICKS) (FRAGMENT)>PIR2: A39034 neurogranin - bovine (fragment)	0.82
11	<NONE>	<NONE>	<NONE>	HUMBYSTIN _1	Homo sapiens bystin mRNA, complete cds	0.81
12	<NONE>	<NONE>	<NONE>	BTBMP1_1	Bos taurus BMP1 gene, partial sequence; Bone morphogenetic protein 1	0.69
13	<NONE>	<NONE>	<NONE>	TCCYSPROT _1	T;congolense mRNA for (prepro) cysteine proteinase	0.56
14	<NONE>	<NONE>	<NONE>	P60_LISIV	PROTEIN P60 PRECURSOR (INVASION-ASSOCIATED PROTEIN)>GP:LISIA PRELB_1 Listeria	0.15

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
					ivanovii extracellular protein homologue (iap) gene, complete cds	
15	<NONE>	<NONE>	<NONE>	HEX_ADE31	HEXON PROTEIN (LATE PROTEIN 2) (FRAGMENT)>PIR2: S37217 hexon protein - human adenovirus 31 (fragment)>GP:HSAT3 1H_1 H;sapiens adenovirus type 31 hexon gene; Hexon protein; Internal fragment containing hypervariable regions	0.15
16	<NONE>	<NONE>	<NONE>	HSU77493_1	Human Notch2 mRNA, partial cds; Transmembrane protein; hN	0.13
17	<NONE>	<NONE>	<NONE>	CYB_PARTE	CYTOCHROME B (EC 1.10.2.2)>PIR2:S07743 cytochrome b - Paramecium tetraurelia mitochondrion (SGC6)>GP:MIPAGE N_19 Paramecium aurelia mitochondrial complete genome; Apocytochrome b (AA 1-391)	0.078
18	<NONE>	<NONE>	<NONE>	HUMERB27_1	Human c-erbB-2 gene, exon 7; C-erb-2 protein	0.054
19	<NONE>	<NONE>	<NONE>	DMTRXIII_2	D;melanogaster DNA for trxl and trxl genes; Trithorax protein trxl; Trithorax; putative>GP:DMTTHO RAX_2 D;melanogaster DNA for (putative) trithorax protein; Predicted trithorax protein	0.047

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
20	<NONE>	<NONE>	<NONE>	CEL0281_5	Caenorhabditis elegans cosmid B0281; Similar to reverse transcriptases	0.043
21	<NONE>	<NONE>	<NONE>	MOTY_VIBP A	SODIUM-TYPE FLAGELLAR PROTEIN MOTY PRECURSOR>GP:VP U06949_4 Vibrio parahaemolyticus BB22 RNase T (rnt) gene and flagellar motor component (motY) gene, complete cds	0.041
22	<NONE>	<NONE>	<NONE>	A56263	beta-galactosidase (EC 3.2.1.23) isozyme 12 - Arthrobacter sp. (strain B7)>GP:ASU17417_1 Arthrobacter sp; beta-galactosidase gene, complete cds	0.04
23	<NONE>	<NONE>	<NONE>	GSA_PSEAE	GLUTAMATE-1-SEMIALDEHYDE 2,1-AMINOMUTASE (EC 5.4.3.8) (GSA) (GLUTAMATE-1-SEMIALDEHYDE AMINOTRANSFERASE) (GSA-AT)>PIR2:S57898 glutamate 1-semialdehyde 2,1-aminomutase - Pseudomonas aeruginosa>GP:PAHE ML_1 P;aeruginosa hemL gene; Glutamate 1-sem	0.038
24	<NONE>	<NONE>	<NONE>	S16323	hypothetical protein - Arabidopsis thaliana>GP:ATHB1_1 A;thaliana homeobox gene Athb-1 mRNA; Open reading frame	0.035

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
25	<NONE>	<NONE>	<NONE>	IRS1_RAT	INSULIN RECEPTOR SUBSTRATE-1>PIR2:S16948 hypothetical protein IRS-1 - rat>GP:RNIRS1IRM_1 R;Norvegicus IRS-1 mRNA for insulin-receptor; During insulin stimulation, undergoes tyrosine phosphorylation and binds phosphatidylinositol 3-kinase	0.027
26	<NONE>	<NONE>	<NONE>	CEM02G9_2	Caenorhabditis elegans cosmid M02G9; M02G9;1; Similar to keratin like protein; cDNA EST yk308g11;5 comes from this gene; cDNA EST yk208e11;5 comes from this gene; cDNA EST yk208e11;3 comes	0.0088
27	<NONE>	<NONE>	<NONE>	S75490_3	competence region: iga=Iga protease, comA=transformation competence [Neisseria gonorrhoeae, MS11, Genomic, 3 genes, 2664 nt]	0.0041
28	<NONE>	<NONE>	<NONE>	EXTN_TOBA C	EXTENSIN PRECURSOR (CELL WALL HYDROXYPROLINE-RICH GLYCOPROTEIN)>PI R2:S06733 hydroxyproline-rich glycoprotein precursor - common tobacco>GP:NTEXT_1 Tobacco HRGPnt3 gene for extensin; Extensin (AA 1-620)	0.0025

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
29	<NONE>	<NONE>	<NONE>	HPCEGS_1	Hepatitis C virus complete genome sequence; Polyprotein	0.0014
30	<NONE>	<NONE>	<NONE>	HHVBC_4	Human hepatitis virus (genotype C, HMA) preS1, preS2, S, C, X, antigens, core antigen, X protein and polymerase	0.00093
31	<NONE>	<NONE>	<NONE>	HSLTGFBP4_1	Homo sapiens mRNA for latent transforming growth factor-beta binding protein-4; Latent TGF-beta binding protein-4	0.00061
32	<NONE>	<NONE>	<NONE>	S74909	transposase - Synechocystis sp. (PCC 6803)>GP:D90909_10 8 Synechocystis sp; PCC6803 complete genome, 11/27, 1311235- 1430418; Transposase; ORF_ID:slr2062	0.00051
33	<NONE>	<NONE>	<NONE>	GRN_MOUSE	GRANULINS PRECURSOR (ACROGRANIN)>GP: MUSAP_1 Mouse gene for acrogranin precursor, complete cds	0.00022
34	<NONE>	<NONE>	<NONE>	CA21_MOUSE	PROCOLLAGEN ALPHA 2(I) CHAIN PRECURSOR>PIR2:A 43291 collagen alpha 2(I) chain precursor - mouse>GP:MMCOL1 A2_1 Mouse COL1A2 mRNA for pro-alpha-2(I) collagen	0.00016
35	<NONE>	<NONE>	<NONE>	MMMHC29N7_2	Mus musculus major histocompatibility locus class III region:butyrophilin-like protein gene, partial cds; Notch4, PBX2, RAGE, lysophatidic acid acyl transferase-	8.00E-05

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
					alpha, palmitoyl-	
36	<NONE>	<NONE>	<NONE>	NFH_RAT	NEUROFILAMENT TRIPLET H PROTEIN (200 KD NEUROFILAMENT PROTEIN) (NF-H) (FRAGMENT)	2.40E-05
37	<NONE>	<NONE>	<NONE>	HUMVWFM_1	Human von Willebrand factor mRNA, 3' end; Von Willebrand factor prepropeptide	1.70E-05
38	<NONE>	<NONE>	<NONE>	CGHU2E	collagen alpha 2(XI) chain - human (fragment)	2.00E-06
39	<NONE>	<NONE>	<NONE>	A61183	hypothetical protein (sdsB region) - Pseudomonas sp.	4.90E-08
40	<NONE>	<NONE>	<NONE>	YM8L_YEAS_T	HYPOTHETICAL 71.1 KD PROTEIN IN DSK2-CAT8 INTERGENIC REGION>PIR2:S5458 5 hypothetical protein YMR278w - yeast (Saccharomyces cerevisiae)>GP:SC802 1X_4 S;cerevisiae chromosome XIII cosmid 8021; Unknown; YM8021;04, unknown, len: 622, CAI: 0;16,	1.50E-09
41	<NONE>	<NONE>	<NONE>	MTCY210_31	Mycobacterium tuberculosis cosmid Y210; Unknown; MTCY210;31, unknown, len: 299 aa, slight similarity to carboxykinases	3.10E-10

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
42	<NONE>	<NONE>	<NONE>	CEC01G10_5	Caenorhabditis elegans cosmid C01G10, complete sequence; C01G10;8; CDNA EST CEMSC45R comes from this gene>GP:CEC01G10_5 Caenorhabditis elegans cosmid C01G10; C01G10;8; CDNA EST CEMSC45R comes from this gene	2.30E-12
43	<NONE>	<NONE>	<NONE>	HSU15779_1	Human p70 (ST5) mRNA, alternatively spliced, complete cds; Differentially expressed; alternatively spliced	9.50E-14
44	<NONE>	<NONE>	<NONE>	MTCY210_31	Mycobacterium tuberculosis cosmid Y210; Unknown; MTCY210;31, unknown, len: 299 aa, slight similarity to carboxykinases	1.70E-17
45	U61403	Dictyostelium discoideum PrlA (prlA) mRNA, partial cds.	1	U93472_1	Danio rerio PPARB gene, partial cds; Nuclear receptor C domain	0.95
46	Z92832	Caenorhabditis elegans DNA *** SEQUENCING IN PROGRESS *** from clone F31D4; HTGS phase 1.	1	U93472_1	Danio rerio PPARB gene, partial cds; Nuclear receptor C domain	0.94
47	L36557	Oryza sativa (clone pRG3) repetitive element.	1	HSU61262_1	Human neogenin mRNA, complete cds	0.89

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
48	AF005898	Homo sapiens Na,K-ATPase beta-3 subunit pseudogene, complete sequence.	1	LRP1_CHICK	LOW-DENSITY LIPOPROTEIN RECEPTOR-RELATED PROTEIN 1 PRECURSOR (LRP) (ALPHA-2-MACROGLOBULIN RECEPTOR) (A2MR)>PIR2:A53102 LDL receptor-related protein / alpha-2-macroglobulin receptor precursor - chicken>GP:GGLRPA 2MR_1 G;gallus mRNA for LRP/alp	0.85
49	U18795	Saccharomyces cerevisiae chromosome V cosmids 9669, 8334, 8199, and lambda clone 1160.	1	NKC1_SQUA C	BUMETANIDE-SENSITIVE SODIUM-(POTASSIUM)-CHLORIDE COTRANSPORTER 2 (NA-K-CL SYMPORTER)>PIR2:A53491 bumetanide-sensitive Na-K-Cl cotransporter - spiny dogfish>GP:SANKCC 1_1 Squalus acanthias bumetanide-sensitive Na-K-Cl cotransport protein (NKCC	0.73
50	AC002523	Homo sapiens; HTGS phase 1, 54 unordered pieces.	1	BXEN_CLOB O	BOTULINUM NEUROTOXIN TYPE E, NONTOXIC COMPONENT>GP:C LOENT120_1 C;botulinum gene for nontoxic component of progenitor toxin, complete cds	0.71

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
51	AC002345	*** SEQUENCING IN PROGRESS *** Genomic sequence from Human 17; HTGS phase 1, 10 unordered pieces.	1	P3K2_DICDI	PHOSPHATIDYLINOSITOL 3-KINASE 2 (EC 2.7.1.137) (PI3-KINASE) (PTDINS-3-KINASE) (PI3K)>GP:DDU23477_1 Dictyostelium discoideum phosphatidylinositol-4,5-diphosphate 3-kinase (PIK2) mRNA, complete cds	0.58
52	X14253	Human mRNA for cripto protein.	1	I55651	noradrenaline transporter - bovine>GP:BTU09198_1 Bos taurus noradrenaline transporter mRNA, complete cds	0.55
53	U23516	Caenorhabditis elegans cosmid B0416.	1	I69024	MHC sex-limited protein - mouse (fragment)>GP:MUSMHC4AD_1 Mouse class III H2-Slp sex-limited protein gene, exons 1, 2 and 3; MHC sex-limited protein	0.47
54	AB006698	Arabidopsis thaliana genomic DNA, chromosome 5, P1 clone: MCL19.	1	S81293_1	L1 {insertion sequence, provirus} [human papillomavirus type 6b HPV6b, KP4, Genomic Mutant, 121 nt]; Authors note this reading frame results from a 454 bp deletion and resulting	0.25
55	K03458	Human immunodeficiency virus type 1, isolate Zaire 6, vif, tat, rev, env, nef genes and 3' LTR.	1	S13383	hydroxyproline-rich glycoprotein - sorghum	0.24

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
56	B26794	T1O16TR TAMU Arabidopsis thaliana genomic clone T1O16.	1	RK34_PORP_U	CHLOROPLAST 50S RIBOSOMAL PROTEIN L34>PIR2:S73111 ribosomal protein L34 - red alga (Porphyra purpurea) chloroplast>GP:PPU38 804_4 Porphyra purpurea chloroplast genome, complete sequence; 50S ribosomal protein L34	0.021
57	Z98950	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 507115; HTGS phase 1.	1	D41132	collagen-related protein 4 - Hydra magnipapillata (fragment)>PIR2:S219 32 mini-collagen - Hydra sp.>GP:HSNCOL4_1 Hydra N-COL 4 mRNA for mini-collagen; No start codon	0.02
58	U57057	Human WD protein IR10 mRNA, complete cds.	1	DMU15602_1	Drosophila melanogaster (zeste-white 4) mRNA, complete cds; Similar to C; elegans B0464;4 gene product, Swiss-Prot Accession Number Q03562	0.019
59	U57057	Human WD protein IR10 mRNA, complete cds.	1	CR2_MOUSE	COMPLEMENT RECEPTOR TYPE 2 PRECURSOR (CR2) (COMPLEMENT C3D RECEPTOR)>PIR2:A4 3526 complement C3d/Epstein-Barr virus receptor 2 precursor - mouse>GP:MUSCR2A A_1 Murine complement receptor type 2 (CR2) mRNA, complete cds; Complement receptor type	0.0074

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
60	B65337	CIT-HSP-2021H21.TF CIT-HSP Homo sapiens genomic clone 2021H21.	1	A38096	perlecan precursor - human>GP:HUMHSP G2B_1 Human heparan sulfate proteoglycan (HSPG2) mRNA, complete cds	0.0051
61	U84722	Human vascular endothelial cadherin mRNA, complete cds.	1	HSTAF113_1	H;sapiens mRNA for TAF1135; Subunit of RNA polymerase II transcription factor TFIID	0.0012
62	L41493	Avian rotavirus (strain turkey 1) genomic segment 4 outer capsid protein (VP8*) gene.	1	Y328_MYCP_N	HYPOTHETICAL PROTEIN MG328 HOMOLOG>PIR2:S73 693 MG328 homolog P01_orf1033 - Mycoplasma pneumoniae (ATCC 29342) (SGC3)>GP:MPAE000 035_2 Mycoplasma pneumoniae from bases 442306 to 452472 (section 35 of 63) of the complete genome; MG328 homolog,	0.00015
63	D63139	Aeromonas sp. gene for chitinase, complete and partial cds.	1	MTCY16B7_3	Mycobacterium tuberculosis cosmid SCY16B7; Unknown; MTCY16B7;03, initiation factor, len: 900, similar at C-terminal half to eg IF2_BACSU P17889 initiation factor if-2 (716 aa), fasta	6.30E-05

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
64	J04974	Human alpha-2 type XI collagen mRNA (COL11A2).	1	GDF6_BOVIN	GROWTH/DIFFERENTIATION FACTOR GDF-6 PRECURSOR (CARTILAGE-DERIVED MORPHOGENETIC PROTEIN 2) (CDMP-2) (FRAGMENT)>PIR2: B55452 cartilage-derived morphogenetic protein 2 precursor - bovine (fragment)>GP:BTU13661_1 Bos taurus cartilage-derived morp	1.00E-05
65	AC002394	Homo sapiens Chromosome 16 BAC clone CIT987-SKA-211C6 ~complete genomic sequence, complete sequence.	1	CELC14F11_6	Caenorhabditis elegans cosmid C14F11; Similar to aspartate aminotransferase; coded for by C; elegans cDNA CEMSF95FB; coded for by C; elegans cDNA yk41e4;3; coded for by C; elegans	4.60E-06
66	AB002312	Human mRNA for KIAA0314 gene, partial cds.	1	NAT1_YEAST	N-TERMINAL ACETYLTRANSFERASE 1 (EC 2.3.1.88) (AMINO-TERMINAL, ALPHA- AMINO, ACETYLTRANSFERASE 1)	1.00E-09
67	AC003085	Human BAC clone RG094H21 from 7q21-q22, complete sequence.	1	DP19_CAEEL	DPY-19 PROTEIN>PIR2:S44629 f22b7.10 protein - Caenorhabditis elegans>GP:CELF22B7_9 C; aenorhabditis elegans (Bristol N2) cosmid F22B7; Putative	4.20E-11
68	X55026	P.anserina complete mitochondrial genome.	1	NAT1_YEAST	N-TERMINAL ACETYLTRANSFERASE 1 (EC 2.3.1.88) (AMINO-TERMINAL, ALPHA- AMINO, ACETYLTRANSFERASE 1)	8.40E-12

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
					ASE 1)	
69	Z95399	Caenorhabditis elegans DNA *** SEQUENCING IN PROGRESS *** from clone Y39B6; HTGS phase 1.	1	CER06B9_5	Caenorhabditis elegans cosmid R06B9, complete sequence; R06B9;b; Protein predicted using Genefinder; preliminary prediction	1.50E-24
70	AC002339	Arabidopsis thaliana chromosome II BAC T11A07 genomic sequence, complete sequence.	0.99	POLG_BVDV S	GENOME POLYPROTEIN>PIR1 :A44217 genome polyprotein - bovine viral diarrhea virus (strain SD-1)>GP:BVDPOLYPR O_1 Bovine viral diarrhea virus polyprotein RNA, complete cds; Putative	1
71	Y08559	B.subtilis urease operon and downstream DNA.	0.99	LRP_CAEEL	LOW-DENSITY LIPOPROTEIN RECEPTOR-RELATED PROTEIN PRECURSOR (LRP)>PIR2:A47437 LDL-receptor-related protein - Caenorhabditis elegans>GP:CEF29D1 1_2 Caenorhabditis elegans cosmid F29D11, complete sequence; F29D11;1; Protein predicted using Genefi	1

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
72	U67548	Methanococcus jannaschii from bases 986219 to 996377 (section 90 of 150) of the complete genome.	0.99	YB60_YEAS T	HYPOTHETICAL 16.3 KD PROTEIN IN DUR1,2-NGR1 INTERGENIC REGION>PIR2:S4608 4 probable membrane protein YBR210w - yeast (Saccharomyces cerevisiae)>GP:SCYB R210W_1 S;cerevisiae chromosome II reading frame ORF YBR210w	1
73	U51645	Plasmodium falciparum cytidine triphosphate synthetase gene, complete cds.	0.99	HPSVRPL_1	Sin Nombre virus (NM H10) RNA L segment encoding RNA polymerase (L protein), complete cds; Viral RNA polymerase (L protein); Putative>GP:HPSVRP LA_1 Sin Nombre virus (NM R11) RNA L segment encoding RNA polymerase (L protein), complete cds; Vir	0.99
74	Z49889	Caenorhabditis elegans cosmid T06H11, complete sequence.	0.99	MUSHDPRO B_1	Mouse alternatively spliced HD protein mRNA, complete cds	0.021
75	Z69374	Human DNA sequence from cosmid L174G8, Huntington's Disease Region, chromosome 4p16.3 contains a pair of ESTs.	0.99	NCPR_YEAS T	NADPH-CYTOCHROME P450 REDUCTASE (EC 1.6.2.4) (CPR)	0.017

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
76	Z35847	S.cerevisiae chromosome II reading frame ORF YBL086c.	0.99	CYPA_CAEE_L	PEPTIDYL-PROLYL CIS-TRANS ISOMERASE 10 (EC 5.2.1.8) (PPIASE) (ROTAMASE) (CYCLOPHILIN-10)>GP:CELB0252_4 Caenorhabditis elegans cosmid B0252; Similar to peptidyl-prolyl cis-trans isomerase (PPIASE) (CYCLOPHILIN)>GP:CEU34954_1 Caenorhabditis el	0.0044
77	L35330	Rattus norvegicus glutathione S-transferase Yb3 subunit gene, complete cds.	0.99	CELR148_1	Caenorhabditis elegans cosmid R148; Contains similarity to drosophila DNA-binding protein K10 (NID:g8148); coded for by C; elegans cDNA yk118e11;5; coded for by C; elegans cDNA	0.0032
78	Y00324	Chicken vitellogenin gene 3' flanking region.	0.99	A56922	transcription factor shn - fruit fly (Drosophila melanogaster)	0.0023
79	M32659	D.melanogaster Shab11 protein mRNA, complete cds.	0.99	OMU25146_1	Oncorhynchus mykiss recombination activating protein 2 gene, partial cds	0.0017
80	Z69880	H.sapiens SERCA3 gene (partial).	0.99	M84D_DROME	MALE SPECIFIC SPERM PROTEIN MST84DD>PIR2:S25775 testis-specific protein Mst84Dd - fruit fly (Drosophila melanogaster)>GP:DM MST84D_4 D;melanogaster Mst84Da, Mst84Db, Mst84Dc and Mst84Dd genes for put; sperm protein	0.0011

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
81	M99166	Escherichia coli Trp repressor binding protein (wrbA) gene, complete cds.	0.99	MTU88962_1	Mycobacterium tuberculosis unknown protein gene, partial cds	6.50E-07
82	X99257	R.norvegicus mRNA for lamin C2.	0.99	MIU68729_1	Meloidogyne incognita cuticle preprocollagen (col-2) mRNA, complete cds; Putative	1.60E-09
83	AC002432	Human BAC clone RG317G18 from 7q31, complete sequence.	0.98	1FMDC	Foot and mouth disease virus type c-s8c1, chain C - foot and mouth disease virus type c-s8c1 expressed in hamster kidney cells	0.14
84	Z34799	Caenorhabditis elegans cosmid F34D10, complete sequence.	0.98	MMU57368_1	Mus musculus EGF repeat transmembrane protein mRNA, complete cds; Notch like repeats; notch 2	0.0028
85	B15207	344E15.TV CIT978SKA1 Homo sapiens genomic clone A-344E15.	0.98	POLG_HCVJ 6	GENOME POLYPROTEIN (CONTAINS: CAPSID PROTEIN C (CORE PROTEIN); MATRIX PROTEIN (ENVELOPE PROTEIN M); MAJOR ENVELOPE PROTEIN E; NONSTRUCTURAL PROTEINS NS1, NS2, NS4A AND NS4B; HELICASE (NS3); RNA-DIRECTED RNA POLYMERASE (EC 2.7.7.48) (NS5))>PI	0.00083

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
86	AC002412	*** SEQUENCING IN PROGRESS *** Human Chromosome X; HTGS phase 1, 2 unordered pieces.	0.98	KDG1_ARATH	DIACYLGLYCEROL KINASE 1 (EC 2.7.1.107) (DIGLYCERIDE KINASE) (DGK 1) (DAG KINASE 1)>PIR2:S71467 diacylglycerol kinase (EC 2.7.1.107) ATDGK1 - Arabidopsis thaliana>GP:ATHATDGK1_1 Arabidopsis thaliana mRNA for diacylglycerol kinase, complete c	0.00024
87	X57010	Human COL2A1 gene for collagen II alpha 1 chain, exons E2-E15.	0.98	D80005_1	Human mRNA for KIAA0183 gene, partial cds	5.90E-10
88	M83093	Neurospora crassa cAMP-dependent protein kinase (cot-1) gene, complete cds.	0.98	YA53_SCHPO	HYPOTHETICAL 24.2 KD PROTEIN C13A11.03 IN CHROMOSOME I>GP:SPAC13A11_3 S;pombe chromosome I cosmid c13A11; Unknown; SPAC13A11;03, unknown, len: 210	3.00E-22
89	U96271	Helicobacter pylori heat shock protein 70 (hsp70) gene, complete cds.	0.97	SLMEN6_1	S;latifolia mRNA for Men-6 protein>GP:SLMEN6_1 S;latifolia mRNA for Men-6 protein	0.43
90	U49944	Caenorhabditis elegans cosmid C39E6.	0.97	RON_HUMAN	MACROPHAGE STIMULATING PROTEIN RECEPTOR PRECURSOR (EC 2.7.1.112)>PIR2:I38185 protein-tyrosine kinase (EC 2.7.1.112), receptor type ron - human>GP:HSRON_1 H;sapiens RON mRNA for tyrosine kinase; Putative	0.034

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
91	Y09255	B.cereus dnaI gene, partial.	0.97	CELT05C1_5	Caenorhabditis elegans cosmid T05C1; Coded for by C; elegans cDNA yk30f6;3; coded for by C; elegans cDNA yk34f10;3	0.00043
92	AC002413	*** SEQUENCING IN PROGRESS *** Human Chromosome X; HTGS phase 1, 2 unordered pieces.	0.96	CELC44E4_5	Caenorhabditis elegans cosmid C44E4; Weak similarity to the drosophila hyperplastic disc protein (GB:L14644); coded for by C; elegans cDNA yk49h6;5; coded for by C; elegans cDNA	1
93	U41625	Caenorhabditis elegans cosmid K03A1.	0.96	HMGC_HUMAN	HIGH MOBILITY GROUP PROTEIN HMGI-C>PIR2:JC2232 high mobility group I-C phosphoprotein - human>GP:HSHMGIC G5_1 Human high-mobility group phosphoprotein isoform I-C (HMGIC) gene, exon 5>GP:HSHMGICP_1 H;sapiens mRNA for HMGI-C protein>GP:HSHMGIC	1
94	Z82202	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 34P24; HTGS phase 1.	0.96	YTH3_CAEE_L	HYPOTHETICAL 75.5 KD PROTEIN C14A4.3 IN CHROMOSOME II>GP:CEC14A4_3 Caenorhabditis elegans cosmid C14A4, complete sequence; C14A4;3; Weak similarity with a B; Flavum translocation protein (Swiss Prot accession number P38376)	0.73

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
95	AL008734	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 324M8; HTGS phase 1.	0.96	S25299	extensin precursor (clone Tom L-4) - tomato>GP:TOMEXT ENB_1 L;esculentum extensin (class II) gene, complete cds	0.0004
96	L15388	Human G protein-coupled receptor kinase (GRK5) mRNA, complete cds.	0.96	HUMCOL7A1 X_1	Homo sapiens (clones: CW52-2, CW27-6, CW15-2, CW26-5, 11-67) collagen type VII intergenic region and (COL7A1) gene, complete cds	4.60E-06
97	X97384	A.thaliana atran3 gene.	0.95	<NONE>	<NONE>	<NONE>
98	M62505	Human C5a anaphylatoxin receptor mRNA, complete cds.	0.95	RIPB_BRYDI	RIBOSOME-INACTIVATING PROTEIN BRYODIN (RRNA N-GLYCOSIDASE) (EC 3.2.2.22) (FRAGMENT)>PIR2: S16491 rRNA N-glycosidase (EC 3.2.2.22) bryodin - red bryony (fragment)	0.83
99	D28778	Cucumber mosaic virus RNA 1 for 1a, complete sequence.	0.95	POLS_RUBV M	STRUCTURAL POLYPROTEIN (CONTAINS: NUCLEOCAPSID PROTEIN C; MEMBRANE GLYCOPROTEINS E1 AND E2)>PIR1:GNWVR3 structural polyprotein - rubella virus (strain M33)>GP:TORUB24S_1 Rubella virus 24S subgenomic mRNA for structural proteins E1, E2 and C;	0.00037
100	AF016202	Homo sapiens immunoglobulin heavy chain CDR3 gene,	0.93	HSU79716_1	Human reelin (RELN) mRNA, complete cds	1

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		partial cds.				
101	Z68303	Caenorhabditis elegans cosmid ZK809, complete sequence.	0.93	HS5HT4SAR_1	H;sapiens mRNA for serotonin 4SA receptor (5-HT4SA-R)	0.87
102	X03049	E. coli DNA sequene 5' to origin of replication oriC.	0.93	S37594	mucin - human (fragment)	0.0019
103	M32659	D.melanogaster Shab11 protein mRNA, complete cds.	0.93	S38480	nonstructural protein - rubella virus>GP:RVM33NP_1 Rubella virus M33 RNA for a nonstructural protein; Nonstructural protein genes	2.30E-06
104	D88687	Human mRNA for KM-102-derived reductase-like factor, complete cds.	0.93	BAT3_HUMAN	LARGE PROLINE-RICH PROTEIN BAT3 (HLA-B-ASSOCIATED TRANSCRIPT 3)>PIR2:A35098 MHC class III histocompatibility antigen HLA-B-associated transcript 3 - human>GP:HUMBAT3A_1 Human HLA-B-associated transcript 3 (BAT3) mRNA, complete cds>GP:HUMBAT3	8.70E-07
105	D16847	Mouse mRNA for stromal cell derived protein-1, complete cds.	0.93	S52796	prpL2 protein - human (fragment)>GP:HSPRP L2_1 H;sapiens mRNA for PRPL-2 protein	3.20E-08

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
106	D90915	Synechocystis sp. PCC6803 complete genome, 17/27, 2137259-2267259.	0.92	YEK9_YEAS T	HYPOTHETICAL 53.9 KD PROTEIN IN AFG3-SEB2 INTERGENIC REGION>PIR2:S5047 7 hypothetical protein YER019w - yeast (Saccharomyces cerevisiae)>GP:SCE95 37_20 Saccharomyces cerevisiae chromosome V cosmid 9537, 9581, 9495, 9867, and lambda clone 5898	5.90E-05
107	AJ001101	Mus musculus mRNA for gC1qBP gene.	0.92	DMU58282_1	Drosophila melanogaster Bowl (bowl) mRNA, complete cds; Transcription factor; C2H2 zinc finger protein; zinc fingers have extensive sequence similarity to Drosophila odd-skipped	3.50E-05
108	X57108	Human gene for cerebroside sulfate activator protein, exons 10-14.	0.92	S69032	hypothetical protein YPR144c - yeast (Saccharomyces cerevisiae)>GP:YSCP9 659_17 Saccharomyces cerevisiae chromosome XVI cosmid 9659; Ypr144cp; Weak similarity near C-terminus to RNA Polymerase beta subunit (Swiss Prot; accession number P11213)	4.30E-21

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
109	D14635	Caenorhabditis elegans DNA for EMB-5.	0.91	YM13_YEAS T	PUTATIVE ATP-DEPENDENT RNA HELICASE YMR128W>PIR2:S53058 probable membrane protein YMR128w - yeast (Saccharomyces cerevisiae)>GP:SC9553_4 S;cerevisiae chromosome XIII cosmid 9553; Unknown; YM9553;04, probable ATP-dependent RNA helicase, len:	0.69
110	B55500	CIT-HSP-387J2.TFB CIT-HSP Homo sapiens genomic clone 387J2.	0.91	U97553_79	Murine herpesvirus 68 strain WUMS, complete genome; Unknown	0.00016
111	X03049	E. coli DNA sequene 5' to origin of replication oriC.	0.9	POL_MLVAV	POL POLYPROTEIN (PROTEASE (EC 3.4.23.-); REVERSE TRANSCRIPTASE (EC 2.7.7.49); RIBONUCLEASE H (EC 3.1.26.4))>PIR1:GNM VGV pol polyprotein - AKV murine leukemia virus	0.0019
112	U91327	Human chromosome 12p15 BAC clone CIT987SK-99D8 complete sequence.	0.89	JC5568	serine protease (EC 3.4.-.-) h1 - Serratia marcescens	1
113	X13295	Rat mRNA for alpha-2u globulin-related protein.	0.89	MNGPOLY_1	Mengo virus polyprotein genome, complete cds withe repeats	1
114	Z78415	Caenorhabditis elegans cosmid C17G1, complete sequence.	0.89	AB000121_1	Mouse mRNA for TBPIP, complete cds; TBP1 interacting protein	0.39

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
115	AC002308	*** SEQUENCING IN PROGRESS *** Human Chromosome 22q11 BAC Clone 1000e4; HTGS phase 1, 26 unordered pieces.	0.88	YLK2_CAEE_L	HYPOTHETICAL 122.7 KD PROTEIN D1044.2 IN CHROMOSOME III>GP:CELD1044_4 Caenorhabditis elegans cosmid D1044	0.0037
116	AC002073	Human PAC clone DJ515N1 from 22q11.2-q22, complete sequence.	0.88	S28499	probable finger protein - rat>GP:RNZFP_1 R;norvegicus mRNA for putative zinc finger protein	1.10E-31
117	Z83848	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 57A13; HTGS phase 1.	0.87	NDL_DROM_E	SERINE PROTEASE NUDEL PRECURSOR (EC 3.4.21.-)>PIR2:A57096 nudel protein precursor - fruit fly (Drosophila melanogaster)>GP:DM U29153_1 Drosophila melanogaster nudel (ndl) mRNA, complete cds; Serine protease; Soma dependent gene required matern	1
118	U23449	Caenorhabditis elegans cosmid K06A1.	0.87	AF023268_3	Homo sapiens clk2 kinase (CLK2), propin1, cotel1, glucocerebrosidase (GBA), and metaxin genes, complete cds; metaxin pseudogene and glucocerebrosidase pseudogene; and thrombospondin3 (THBS3)	0.21
119	Z68181	H.vulgaris mRNA for elongation factor EF1-alpha.	0.87	RABCY450C_1	Rabbit cytochrome P-450 gene, clone pP-450PBc3, 3' end	0.14

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
120	AC000033	Homo sapiens chromosome 9, complete sequence.	0.87	VWF_CANF_A	VON WILLEBRAND FACTOR PRECURSOR>GP:DO GVWG_1 Canis familiaris von Willebrand factor mRNA, complete cds	0.036
121	U23449	Caenorhabditis elegans cosmid K06A1.	0.86	S48988_1	CRP-1=cystatin-related protein [rats, Wistar albino, mRNA Partial, 213 nt]; Cystatin-related protein; Method: conceptual translation supplied by author; This sequence comes from Fig;	0.64
122	Z89651	F.rubripes GSS sequence, clone 090124cD5.	0.86	CPU65981_1	Cryptosporidium parvum P-ATPase gene (CppA-E1) gene, complete cds; Putative calcium-ATPase	0.6
123	Z94055	Human DNA sequence from PAC 24M15 on chromosome 1. Contains tenascin-R (restrictin), EST.	0.86	GLTB_SYNY_3	FERREDOXIN-DEPENDENT GLUTAMATE SYNTHASE 1 (EC 1.4.7.1) (FD-GOGAT)>PIR2:S60228 glutamate synthase (ferredoxin) (EC 1.4.7.1) gltB - Synechocystis sp. (PCC 6803)>GP:D90902_66 Synechocystis sp; PCC6803 complete genome, 4/27, 402290-524345; Gluta	0.03
124	Z49250	Human DNA sequence from cosmid HW2, Huntington's Disease Region, chromosome 4p16.3.	0.86	TRSCAPSID_1	Tobacco ringspot virus capsid protein gene, complete cds	3.00E-06

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
125	Z92855	Caenorhabditis elegans DNA *** SEQUENCING IN PROGRESS *** from clone Y48C3; HTGS phase 1.	0.84	AE000809_8	Methanobacterium thermoautotrophicum from bases 161632 to 172569 (section 15 of 148) of the complete genome; Aspartyl-tRNA synthetase; Function Code:10;07 - Metabolism of	1
126	AC002340	*** SEQUENCING IN PROGRESS *** Arabidopsis thaliana 'TAMU' BAC 'T11J7' genomic sequence near marker 'm283'; HTGS phase 1, 2 unordered pieces.	0.83	CET01E8_3	Caenorhabditis elegans cosmid T01E8, complete sequence; T01E8;3; Similar to 1-phosphatidylinositol-4,5-bisphosphate phosphodiesterase; cDNA EST CEESG02F comes from this gene;	0.86
127	AL008716	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 206C7; HTGS phase 1.	0.83	HIVU51189_5	HIV-1 clone 93th253 from Thailand, complete genome; Tat protein	0.86
128	AC002340	*** SEQUENCING IN PROGRESS *** Arabidopsis thaliana 'TAMU' BAC 'T11J7' genomic sequence near marker 'm283'; HTGS phase 1, 2 unordered pieces.	0.83	S60257	meltrin alpha - mouse>GP:MUSMAB_1 Mouse mRNA for meltrin alpha, complete cds	0.0013

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
129	Z83848	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 57A13; HTGS phase 1.	0.82	ARO1_PNEC_A	PENTAFUNCTIONAL AROM POLYPEPTIDE (CONTAINS: 3-DEHYDROQUINATE SYNTHASE (EC 4.6.1.3), 3-DEHYDROQUINATE DEHYDRATASE (EC 4.2.1.10) (3-DEHYDROQUINASE), SHIKIMATE 5-DEHYDROGENASE (EC 1.1.1.25), SHIKIMATE KINASE (EC 2.7.1.71), AND EPSP SYNTHASE (E	0.0098
130	AF029308	Homo sapiens chromosome 9 duplication of the T cell receptor beta locus and trypsinogen gene families.	0.8	CELZK84_5	Caenorhabditis elegans cosmid ZK84; Final exon in repeat region; similar to long tandem repeat region of sialidase (SP:TCNA_TRYCR, P23253) and neurofilament H protein; coded for by C; elegans	2.00E-08
131	AC002458	Human BAC clone RG098M04 from 7q21-q22, complete sequence.	0.78	IGF2_PIG	INSULIN-LIKE GROWTH FACTOR II PRECURSOR (IGF-II)>GP:SSIGF2_1 S;scrofa mRNA IGF2 for insulin-like-growth factor 2; Insulin-like-growth factor 2 preproprotein	0.44
132	Z83843	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 368A4; HTGS phase 1.	0.78	PAR51A_1	P;tetraurelia 51A surface protein gene, complete cds	0.0014

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
133	X03021	Human gene for granulocyte-macrophage colony stimulating factor (GM-CSF).	0.78	CEF57B1_3	Caenorhabditis elegans cosmid F57B1, complete sequence; F57B1;3; Protein predicted using Genefinder; similar to collagen	2.20E-05
134	Z74825	S.cerevisiae chromosome XV reading frame ORF YOL083w.	0.77	SYLM_SCHP O	PUTATIVE LEUCYL-TRNA SYNTHETASE, MITOCHONDRIAL PRECURSOR (EC 6.1.1.4) (LEUCINE--TRNA LIGASE)>PIR2:S6248 6 hypothetical protein SPAC4G8.09 - fission yeast (Schizosaccharomyces pombe)>GP:SPAC4G8_9 S;pombe chromosome I cosmid c4G8; Unknown; SPAC	0.96
135	Z74825	S.cerevisiae chromosome XV reading frame ORF YOL083w.	0.77	RNU59809_1	Rattus norvegicus mannose 6-phosphate/insulin-like growth factor II receptor (M6P/IGF2r) mRNA, complete cds; Also termed IGF-II/Man 6-P receptor, MPR, CI-MPR	0.01
136	U80445	Caenorhabditis elegans cosmid C50F2.	0.76	S28499	probable finger protein - rat>GP:RNZFP_1 R;norvegicus mRNA for putative zinc finger protein	1.10E-31
137	Z78545	Caenorhabditis elegans cosmid M03B6, complete sequence.	0.75	RRU73586_1	Rattus norvegicus Fanconi anemia group C mRNA, complete cds; Fanconi anemia group C protein; Similar to human FAC protein, GenBank Accession Numbers X66893 and X66894	0.023

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
138	Z97630	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 466N1; HTGS phase 1.	0.74	HSMSHREC A_1	H;sapiens mRNA for MSH receptor; Author-given protein sequence is in conflict with the conceptual translation	0.036
139	AF007269	Arabidopsis thaliana BAC IG002N01.	0.71	HSU95090_1	Homo sapiens chromosome 19 cosmid F19541, complete sequence; F19541_1; Hypothetical (partial) protein similar to proline oxidase	0.16
140	AC002393	Mouse BAC284H12 Chromosome 6, complete sequence.	0.7	RNLTP2_1	Rattus norvegicus mRNA for LTBP-2 like protein; Latent TGF-beta binding protein-2 like protein	4.40E-05
141	B15232	344G8.TV CIT978SKA1 Homo sapiens genomic clone A-344G08.	0.67	DMSEVL2_2	Drosophila melanogaster sevenless mRNA; Put; sevenless protein (AA 1 - 2510)	0.41
142	D13748	Human mRNA for eukaryotic initiation factor 4A1.	0.66	MMU53563_1	Mus musculus Brg1 mRNA, partial cds; N-terminal region of the protein	0.00016
143	S45791	band 3-related protein=renal anion exchanger AE2 homolog [rabbits, New Zealand White, ileal epithelial cells, mRNA, 3964 nt].	0.66	POLS_RUBV R	STRUCTURAL POLYPROTEIN (CONTAINS: NUCLEOCAPSID PROTEIN C; MEMBRANE GLYCOPROTEINS E1 AND E2)>PIR1:GNWVRA structural polyprotein - rubella virus (strain RA27/3 vaccine)>GP:RUBCE2 1_1 Rubella virus RA27/3 RNA for capsid, E2 and E1 proteins; Poly	5.60E-05
144	M22462	Chicken protein p54 (ets-1)	0.66	HSHP8PROT _1	H;sapiens mRNA for HP8 protein; HP8	2.00E-06

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		mRNA, complete cds.			peptide	
145	U27999	Human clone pDEL52A11 HLA-C region cosmid 52 genomic survey sequence.	0.65	CA18_HUMAN	COLLAGEN ALPHA 1(VIII) CHAIN PRECURSOR (ENDOTHELIAL COLLAGEN)>PIR2:S15435 collagen alpha 1(VIII) chain precursor - human>GP:HSCOL8A1_1 Human COL8A1 mRNA for alpha 1(VIII) collagen	5.70E-06
146	M54787	N.crassa mating type a-1 protein (mt a-1) gene, exons 1-3.	0.64	I50717	vacuolar H ⁺ -ATPase A subunit - chicken (fragment)>GP:GGU22078_1 Gallus gallus vacuolar H ⁺ -ATPase A subunit gene, partial cds	0.0046
147	AC002094	Genomic sequence from Human 17, complete sequence.	0.63	PVPVA1_1	P;vivax pva1 gene	0.1
148	U32701	Haemophilus influenzae from bases 165345 to 176101 (section 16 of 163) of the complete genome.	0.63	FABG_HAEI	3-OXOACYL-[ACYL-CARRIER PROTEIN] REDUCTASE (EC 1.1.1.100) (3-KETOACYL-ACYL CARRIER PROTEIN REDUCTASE)>PIR2:D64051 3-oxoacyl-[acyl-carrier-protein] reductase (EC 1.1.1.100) - Haemophilus influenzae (strain Rd KW20)>GP:HIU32701_7 Haemophilus	2.00E-12
149	Z37159	T.brucei serum resistance associated (SRA) mRNA for VSG-like protein.	0.61	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
150	AF027865	Mus musculus Major Histocompatibility Locus class II region.	0.61	A56514	chromokinesin - chicken>GP:GGU18309_1 Gallus gallus chromokinesin mRNA, complete cds	0.045
151	U40938	Caenorhabditis elegans cosmid D1009.	0.61	YA53_SCHPO	HYPOTHETICAL 24.2 KD PROTEIN C13A11.03 IN CHROMOSOME I>GP:SPAC13A11_3 S;pombe chromosome I cosmid c13A11; Unknown; SPAC13A11;03, unknown, len: 210	1.90E-24
152	116670	Sequence 1 from patent US 5476781.	0.59	CELF21F8_7	Caenorhabditis elegans cosmid F21F8; Similar to eukaryotic aspartyl proteases	0.39
153	Z84468	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 299D3; HTGS phase 1.	0.59	CLG1_YEAST	CYCLIN-LIKE PROTEIN CLG1>PIR2:S37607 cyclin-like protein YGL215w - yeast (Saccharomyces cerevisiae)>GP:SCYG L215W_1 S;cerevisiae chromosome VII reading frame ORF YGL215w>GP:YSCC LG1CPR_1 Saccharomyces cerevisiae cyclin-like protein (CLG1) gene	0.0015
154	U00054	Caenorhabditis elegans cosmid K07E12.	0.57	<NONE>	<NONE>	<NONE>
155	M21207	Synthetic SV40 T antigen mutant pseudogene, 3' end.	0.57	1CJL2	cathepsin L (EC 3.4.22.15) mutant (F(78P)L, C25S, T110A, E176G, D178G), fragment 2 - human	0.43

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
156	AF020282	Dictyostelium discoideum DG2033 gene, partial cds.	0.56	AC002125_4	Homo sapiens DNA from chromosome 19-cosmid F25965, genomic sequence, complete sequence; F25965_5; Hypothetical 35;3 kDa protein similar to GTPase-activating proteins and orf3 from	0.6
157	M86352	Stigmatella aurantiaca reverse transcriptase (163 RT) gene, complete cds.	0.56	AC002398_4	Human DNA from chromosome 19-specific cosmid F25965, genomic sequence, complete sequence; F25965_3; Hypothetical 96 kDa human protein similar to alpha chimaerin; Hypothetical protein>GP:AC002398_4 Human DNA from chromosome 19-specific cosmi	4.50E-06
158	AC003101	*** SEQUENCING IN PROGRESS *** Homo sapiens chromosome 17, clone HRPC41C23; HTGS phase 1, 33 unordered pieces.	0.54	<NONE>	<NONE>	<NONE>
159	B12117	F5L15-T7 IGF Arabidopsis thaliana genomic clone F5L15.	0.54	CEF32H2_5	Caenorhabditis elegans cosmid F32H2, complete sequence; F32H2;5; Similarity to Chicken fatty acid synthase (SW:P12276); cDNA EST yk16c2;5 comes from this gene; cDNA EST yk113h6;5 comes	1

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
160	AE000664	Mus musculus TCR beta locus from bases 250554 to 501917 (section 2 of 3) of the complete sequence.	0.54	CET01G9_6	Caenorhabditis elegans cosmid T01G9, complete sequence; T01G9;4; CDNA EST yk29b7;5 comes from this gene	0.84
161	B12117	F5L15-T7 IGF Arabidopsis thaliana genomic clone F5L15.	0.54	A39718	nicotinic acetylcholine receptor alpha chain - marbled electric ray (fragments)	0.27
162	Z71261	Caenorhabditis elegans cosmid F21C3, complete sequence.	0.5	KDGE_DROME	EYE-SPECIFIC DIACYLGLYCEROL KINASE (EC 2.7.1.107) (RETINAL DEGENERATION A PROTEIN) (DIGLYCERIDE KINASE) (DGK)>GP:DRODAG K_1 Fruit fly mRNA for diacylglycerol kinase, complete cds	4.60E-05
163	M61831	Human S-adenosylhomocysteine hydrolase (AHCY) mRNA, complete cds.	0.49	P2C2_ARATH	PROTEIN PHOSPHATASE 2C (EC 3.1.3.16) (PP2C)>PIR2:S55457 phosphoprotein phosphatase (EC 3.1.3.16) 2C - Arabidopsis thaliana>GP:ATHPP2 CA_1 Arabidopsis thaliana mRNA for protein phosphatase 2C	5.60E-08
164	U42608	Glycine max clathrin heavy chain mRNA, complete cds.	0.48	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
165	Z93042	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 6B17; HTGS phase 1.	0.47	PYRD_BACS U	DIHYDROOROTATE DEHYDROGENASE (EC 1.3.3.1) (DIHYDROOROTATE OXIDASE) (DHODEHASE)>PIR1:H39845 dihydroorotate oxidase (EC 1.3.3.1) - Bacillus subtilis>GPN:BSUB0009_25 Bacillus subtilis complete genome (section 9 of 21): from 1598421 to 1807200;	0.002
166	AC000044	Human Chromosome 22q13 Cosmid Clone p76e10, complete sequence.	0.47	MATK_MAR PO	PROBABLE INTRON MATURASE>PIR2:A05034 hypothetical protein 370i - liverwort (Marchantia polymorpha) chloroplast>GP:CHMPXX_21 Liverwort Marchantia polymorpha chloroplast genome DNA; ORF370i	0.0011
167	X51508	Rabbit mRNA for aminopeptidase N (partial).	0.47	S45361	LRR47 protein - fruit fly (Drosophila melanogaster)>GP:DM LRR47_1 D;melanogaster mRNA for LRR47	5.30E-07
168	Z67035	H.sapiens DNA segment containing (CA) repeat; clone AFM323yf1; single read.	0.45	JQ2246	22.5K cathepsin D inhibitor protein precursor - potato>GP:POTCATH D_1 Potato cathepsin D inhibitor protein mRNA, complete cds	0.79
169	Z93042	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 6B17; HTGS phase 1.	0.44	SMU31768_1	Schistosoma mansoni elastase gene, 3045 bp clone, complete cds	0.0022

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
170	L11172	Plasmodium falciparum RNA polymerase I gene, complete cds.	0.43	HUMPKD1G08_1	Homo sapiens polycystic kidney disease (PKD1) gene, exons 43-46; Polycystic kidney disease 1 protein	1
171	Z95889	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 211A9; HTGS phase 1.	0.43	A09811_1	R;norvegicus mRNA for BRL-3A binding protein; Author-given protein sequence is in conflict with the conceptual translation	0.00083
172	U32772	Haemophilus influenzae from bases 954819 to 966363 (section 87 of 163) of the complete genome.	0.43	YPT2_CAEE L	HYPOTHETICAL 21.6 KD PROTEIN F37A4.2 IN CHROMOSOME III>PIR2:S44639 F37A4.2 protein - Caenorhabditis elegans>GP:CELF37A4_8 Caenorhabditis elegans cosmid F37A4	2.50E-28
173	Z99281	Caenorhabditis elegans cosmid Y57G11C, complete sequence.	0.42	PTU19464_1	Paramecium tetraurelia outer arm dynein beta heavy chain gene, complete cds	1
174	X04571	Human mRNA for kidney epidermal growth factor (EGF) precursor.	0.42	YEK9_YEAS T	HYPOTHETICAL 53.9 KD PROTEIN IN AFG3-SEB2 INTERGENIC REGION>PIR2:S50477 hypothetical protein YER019w - yeast (Saccharomyces cerevisiae)>GP:SCE9537_20 Saccharomyces cerevisiae chromosome V cosmids 9537, 9581, 9495, 9867, and lambda clone 5898	0.99

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
175	U32772	Haemophilus influenzae from bases 954819 to 966363 (section 87 of 163) of the complete genome.	0.41	YPT2_CAEE_L	HYPOTHETICAL 21.6 KD PROTEIN F37A4.2 IN CHROMOSOME III>PIR2:S44639 F37A4.2 protein - Caenorhabditis elegans>GP:CELF37A4_8 Caenorhabditis elegans cosmid F37A4	7.80E-21
176	AC002053	Human Chromosome 9p22 Cosmid Clone 92f5, complete sequence.	0.4	HSU33837_1	Human glycoprotein receptor gp330 precursor, mRNA, complete cds	1
177	U88309	Caenorhabditis elegans cosmid T23B3.	0.4	DROMTTGN_C_1	Drosophila melanogaster mitochondrial cytochrome c oxidase subunit I (COI) gene, 5' end, Trp-, Cys-, and Tyr-tRNA genes, NADH dehydrogenase subunit 2 (ND2) gene, 3' end	0.99
178	M34025	Human fetal Ig heavy chain variable region (clone M44) mRNA, partial cds.	0.39	DNA2_YEAS_T	DNA REPLICATION HELICASE DNA2>PIR2:S48904 probable purine nucleotide-binding protein YHR164c - yeast (Saccharomyces cerevisiae)>GPN:YSC H9986_3 Saccharomyces cerevisiae chromosome VIII cosmid 9986; Dna2p: DNA replication helicase; YHR164C>GP:	1
179	AC002395	Homo sapiens; HTGS phase 1, 127 unordered pieces.	0.39	VV_MUMPE	NONSTRUCTURAL PROTEIN V (NONSTRUCTURAL PROTEIN NS1)	0.11

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
180	AC003101	*** SEQUENCING IN PROGRESS *** Homo sapiens chromosome 17, clone HRPC41C23; HTGS phase 1, 33 unordered pieces.	0.39	YLK2_CAEE_L	HYPOTHETICAL 122.7 KD PROTEIN D1044.2 IN CHROMOSOME III>GP:CELD1044_4 Caenorhabditis elegans cosmid D1044	0.0001
181	Z54335	Human DNA sequence from cosmid L17A9, Huntington's Disease Region, chromosome 4p16.3. Contains VNTR and a CpG island.	0.39	HUMNFAT3_A_1	Homo sapiens NF-AT3 mRNA, complete cds	1.60E-06
182	U95743	Homo sapiens chromosome 16 BAC clone CIT987-SK65D3, complete sequence.	0.38	CEZC434_6	Caenorhabditis elegans cosmid ZC434, complete sequence; ZC434;6; CDNA EST CEESO02F comes from this gene; cDNA EST CEES60F comes from this gene	0.18
183	AC001229	Sequence of BAC F5114 from Arabidopsis thaliana chromosome 1, complete sequence.	0.34	HSOCAM_1	H;sapiens mRNA for immunoglobulin-like domain-containing 1 protein	0.051
184	X01703	Human gene for alpha-tubulin (b alpha 1).	0.33	NTC3_MOUS_E	NEUROGENIC LOCUS NOTCH 3 PROTEIN>PIR2:S45306 notch 3 protein - mouse>GP:MMNOTC_1 M;musculus mRNA for Notch 3	0.012

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
185	Z82189	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 170A21; HTGS phase 1.	0.31	LG106_3	Lemna gibba negatively light-regulated mRNA (Lg106); Second longest ORF (2)	0.27
186	Z98051	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 501A4; HTGS phase 1.	0.3	S34960	NADH dehydrogenase (ubiquinone) (EC 1.6.5.3) chain 5 - Crithidia oncopelti mitochondrion (SGC6)>GP:MICOEN NR_3 Crithidia oncopelti mitochondrial ND4, ND5, COI, 12S ribosomal RNA genes for NADH dehydrogenase subunit 4/5, cytochrome oxidase subun	0.25
187	Z98749	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 449O17; HTGS phase 1.	0.3	SCKC_LEIQ H	CHARYBDOTOXIN (CHTX) (CHTX-LQ1)>PIR2:A60963 charybdotoxin 1 - scorpion (Leiurus quinquestriatus)>3D:2 CRD Charybdotoxin (nmr, 12 structures) - scorpion (Leiurus quinquestriatus)	0.12
188	X96763	C.albicans CDC4 gene.	0.29	CECC4_1	Caenorhabditis elegans cosmid CC4, complete sequence; CC4;a; Protein predicted using Genefinder; preliminary prediction	1.30E-17

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
189	U38804	Porphyra purpurea chloroplast genome, complete sequence.	0.28	HIVHCDR3C_1	Human immunodeficiency virus type 1 heavy-chain complementarity-determining region 3 mRNA (clone 11), partial cds; Heavy-chain complementarity-determining region 3 (CDR3) from HIV gp120->GP:HIVHCDR3I_1 Human immunodeficiency virus type 1 he	1
190	U20657	Human ubiquitin protease (Unph) proto-oncogene mRNA, complete cds.	0.28	HSU20657_1	Human ubiquitin protease (Unph) proto-oncogene mRNA, complete cds	5.60E-12
191	AC002037	Human Chromosome 11 Overlapping Cosmids cSRL72g7 and cSRL140b8, complete sequence.	0.27	VRP1_YEAS_T	VERPROLIN>GP:SC VERPRL_1 S;cerevisiae (A364) gene for verprolin	2.00E-11
192	U58748	Caenorhabditis elegans cosmid ZK180.	0.27	EXLP_TOBA_C	PISTIL-SECIFIC EXTENSIN-LIKE PROTEIN PRECURSOR (PELP)>PIR2:JQ1696 pistil extensin-like protein precursor (clone pMG15) - common tobacco>GP:NTPMG15_1 N;tabacum mRNA for pistil extensin like protein	4.10E-12
193	Z68013	Caenorhabditis elegans cosmid W02H3, complete sequence.	0.26	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
194	AF017042	Dictyostelium discoideum LTR-retrotransposon Skipper, partial genomic sequence, 5' end.	0.26	SPBC31F10_14	S;pombe chromosome II cosmid c31F10; Hypothetical protein; SPBC31F10;14c, unknown, len:1586aa, some similarity eg; to YJR140C, YJ9H_YEAST, P47171, involved in cell cycle regulation	1
195	B03174	cSRL-16e2-u cSRL flow sorted Chromosome 11 specific cosmid Homo sapiens genomic clone cSRL-16e2.	0.26	CELC30E1_7	Caenorhabditis elegans cosmid C30E1	0.38
196	X70810	E.gracilis chloroplast complete genome.	0.25	CEK10H10_8	Caenorhabditis elegans cosmid K10H10, complete sequence; K10H10;k; Protein predicted using Genefinder; preliminary prediction	0.98
197	U80024	Caenorhabditis elegans cosmid C18B10.	0.25	MMAF001794_1	Mus musculus Treacher Collins Syndrome protein (Tcof1) mRNA, complete cds; Putative nucleolar phosphoprotein; similar to Homo sapiens Treacher Collins syndrome TCOF1 protein encoded>GP:MMAF001794_1 Mus musculus Treacher Collins Syndrome p	0.017

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
198	AC000591	Drosophila melanogaster (subclone 9_g3 from P1 DS01486 (D32)) DNA sequence, complete sequence.	0.25	YHGE_ECOL I	HYPOTHETICAL 64.6 KD PROTEIN IN MRCA-PCKA INTERGENIC REGION (F574)>PIR2:E65135 hypothetical 64.6 kD protein in mrcA-pckA intergenic region - Escherichia coli (strain K-12)>GP:ECAE000415_7 Escherichia coli , mrcA, yrfE, yrfF, yrfG, yrfH, yrfI	0.00068
199	AC000591	Drosophila melanogaster (subclone 9_g3 from P1 DS01486 (D32)) DNA sequence, complete sequence.	0.25	YHGE_ECOL I	HYPOTHETICAL 64.6 KD PROTEIN IN MRCA-PCKA INTERGENIC REGION (F574)>PIR2:E65135 hypothetical 64.6 kD protein in mrcA-pckA intergenic region - Escherichia coli (strain K-12)>GP:ECAE000415_7 Escherichia coli , mrcA, yrfE, yrfF, yrfG, yrfH, yrfI	0.00068
200	Z99571	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 388N15; HTGS phase 1.	0.24	YA53_SCHP O	HYPOTHETICAL 24.2 KD PROTEIN C13A11.03 IN CHROMOSOME I>GP:SPAC13A11_3 S;pombe chromosome I cosmid c13A11; Unknown; SPAC13A11;03, unknown, len: 210	0.017
201	U00672	Human interleukin-10 receptor mRNA, complete cds.	0.24	TFDP00900	- Polypeptides entry for factor Oct-2.5	1.00E-05

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
202	AC003061	*** SEQUENCING IN PROGRESS *** Mouse Chromosome 6 BAC clone b245c12; HTGS phase 2, 8 ordered pieces.	0.23	CG1_HUMAN	CG1 PROTEIN>GP:HSU46 023_1 Human Xq28 mRNA, complete cds; Orf	0.00078
203	AF009420	Homo sapiens microsatellite sequence in the HNF3a gene.	0.22	PN0675	collagen alpha 1(XVIII) chain - mouse (fragment)>GP:MUSC OLLAG_1 Mouse mRNA for collagen, partial cds	0.00072
204	B18861	F20C18-Sp6 IGF Arabidopsis thaliana genomic clone F20C18.	0.22	TFDP00659	- Polypeptides entry for factor PR	0.0003
205	U00672	Human interleukin-10 receptor mRNA, complete cds.	0.22	TFDP00900	- Polypeptides entry for factor Oct-2.5	1.00E-05
206	X52105	Dictyostelium discoideum SP60 gene for spore coat protein.	0.18	<NONE>	<NONE>	<NONE>
207	L07628	Saccharopolyspor a erythraea insertion sequence IS1136, copy B, 3' end.	0.17	D88764_1	Rana catesbeiana mRNA for alpha 2 type I collagen, complete cds	0.00021
208	Z49631	S.cerevisiae chromosome X reading frame ORF YJR131w.	0.16	YSCDAL1A_1	Saccharomyces cerevisiae alantoinase (DAL1) gene, complete cds	1
209	Z87893	F.rubripes GSS sequence, clone 043C17aB8.	0.16	CEL27A12_8	Caenorhabditis elegans cosmid C27A12; Partial CDS; this gene begins in the neighboring clone; coded for by C; elegans cDNA yk127f1;3; coded for by C; elegans cDNA yk127f1;5	1.30E-07

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
210	U92852	Rhoiptelea chiliantha maturase (matK) gene, chloroplast gene encoding chloroplast protein, complete cds.	0.15	SEU40259_5	Staphylococcus epidermidis trimethoprim resistance plasmid pSK639; Orf53	0.95
211	X62620	B.mori Abd-A gene homeobox.	0.15	ATAP22_36	Arabidopsis thaliana DNA chromosome 4, ESSA I AP2 contig fragment No; 2; Hypothetical protein; Similarity to NADH dehydrogenase, Chondrus crispus; MNOS:S59107	0.75
212	J02079	epstein-barr virus simple repeat array (ir3).	0.15	A38346	ultra-high-sulfur keratin 1 - mouse>GP:MUSSE1_1 Mouse serine 1 ultra high sulfur protein gene, complete cds; Putative	7.50E-05
213	M35027	Vaccinia virus, complete genome.	0.14	MTF1_FUSN U	MODIFICATION METHYLASE FNUDI (EC 2.1.1.73) (CYTOSINE-SPECIFIC METHYLTRANSFERASE FNUDI) (M.FNUDI)	0.87
214	AC003058	*** SEQUENCING IN PROGRESS *** Arabidopsis thaliana 'IGF' BAC 'F27F23' genomic sequence near marker 'CIC06E08'; HTGS phase 1, 8 unordered pieces.	0.14	HEXA_DICDI	BETA-HEXOSAMINIDASE ALPHA CHAIN PRECURSOR (EC 3.2.1.52) (N-ACETYL-BETA-GLUCOSAMINIDASE) (BETA-N-ACETYLHEXOSAMINIDASE)>PIR2:A30766 beta-N-acetylhexosaminidase (EC 3.2.1.52) A precursor - slime mold (Dictyostelium	0.006

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
					discoideum>GP:DDIN AGA_1 D;d	
215	AC001229	Sequence of BAC F5I14 from Arabidopsis thaliana chromosome 1, complete sequence.	0.13	A49281	pol protein - simian T-cell lymphotropic virus type 1, STL V-1 (isolate Bab34) (fragment)>GP:STVB ABPOLA_1 Simian T-cell leukemia virus PCR derived (pol) gene, partial sequence BAB34POL; Bases 4779-4918 EMBL ATK numbering system; BAB34POL	0.77
216	U46067	Capra hircus beta-mannosidase mRNA, complete cds.	0.12	S70663	lectin heavy chain, N-acetylgalactosamine-specific - Entamoeba histolytica (fragment)>GP:EhU33 443_1 Entamoeba histolytica GalNAc lectin heavy subunit (hgl4) gene, partial cds; N-acetylgalactosamine adherence lectin heavy subunit	0.8
217	AC000380	*** SEQUENCING IN PROGRESS *** Human Chromosome 3 pac pDJ70i11; HTGS phase 1, 2 unordered pieces.	0.12	ATFCA8_19	Arabidopsis thaliana DNA chromosome 4, ESSA I contig fragment No; 8; Unnamed protein product	0.64

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
218	X61207	A.brasilense hisB, H, A, F and E genes for imidazole glycerolphosphate dehydratase, glutamine amidotransferase, phosphorybosilformimino-5-amino-phosphorybosil-4-imidazolecarboxamide isomerase, cyclase and phosphorybosil-AMP-cyclohydrolase.	0.12	OCCLO2_1	O;circumcincta colost-2 gene; Cuticular collagen	0.0074
219	AF014259	HIV-1 Patient 1088 from Edinburgh, MA-p17 (gag) gene, partial cds.	0.11	DMU88570_1	Drosophila melanogaster CREB-binding protein homolog mRNA, complete cds; CBP	1
220	AC000636	Drosophila melanogaster (subclone 2_c11 from P1 DS07660 (D44)) DNA sequence, complete sequence.	0.11	A64829	hypothetical protein in dmsC 3' region - Escherichia coli (strain K-12)>GP:ECAE000192_1 Escherichia coli , ycaD, ycaK, pflA, pflB, focA genes from bases 944908 to 955952 (section 82 of 400) of the complete genome; Hypothetical protein in dmsC	0.051
221	AC002428	Human BAC clone GS039E22 from 5q31, complete sequence.	0.11	HSNMYC2_1	Human N-myc gene exon 2; Put; N-myc protein (aa 1-263) (953 is 1st base in codon)	0.00014
222	L40949	Homo sapiens (clone AT7-5eu) opioid-receptor-like protein mRNA, 5' end.	0.11	CEUNC93_2	C.elegans unc-93 gene; Protein 2	1.20E-13

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
223	AL008636	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 722E9; HTGS phase 1.	0.1	XELCOL2A1 A_1	Xenopus laevis alpha-1 collagen type II' mRNA, complete cds; Alpha-1 type II' collagen	2.60E-06
224	D86993	Human (lambda) DNA for immunoglobulin light chain.	0.1	CELM02B7_2	Caenorhabditis elegans cosmid M02B7	1.80E-09
225	AC002539	Homo sapiens chromosome 17, clone 195o20, complete sequence.	0.098	MTCY7D11_17	Mycobacterium tuberculosis cosmid Y7D11; Unknown; MTCY07D11;17c; unknown, len: 186 aa, FASTA best: Q10390 Y009_MYCTU hypothetical 31;0 KD protein MTCY190;09C (299 aa) opt: 355 z-score: 316;8	0.026
226	M88165	Human inter-alpha-trypsin inhibitor light chain (ITI) gene, exon 1.	0.096	A54161	ryanodine-binding protein alpha form - bullfrog>GP:D21070_1 Rana catesbeiana mRNA for bullfrog skeletal muscle calcium release channel (ryanodine receptor) alpha isoform(RyR1), complete cds; Ryanodine receptor alpha isoform	1
227	Z92851	Caenorhabditis elegans DNA *** SEQUENCING IN PROGRESS *** from clone Y39G8; HTGS phase 1.	0.082	CYA7_BOVI N	ADENYLATE CYCLASE, TYPE VII (EC 4.6.1.1) (ATP PYROPHOSPHATE-LYASE) (ADENYLYL CYCLASE)	0.3

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
228	L00638	Arabidopsis thaliana ubiquitin conjugating enzyme exons 2-4.	0.072	NUCM_TRY BB	NADH-UBIQUINONE OXIDOREDUCTASE 49 KD SUBUNIT HOMOLOG (EC 1.6.5.3) (NADH DEHYDROGENASE SUBUNIT 7 HOMOLOG)>PIR2:A3 5693 NADH dehydrogenase (EC 1.6.99.3) chain 7 - Trypanosoma brucei mitochondrion (SGC6)	0.24
229	U49169	Dictyostelium discoideum V-ATPase A subunit (vata) mRNA, complete cds.	0.071	MMU65594_1	Mus musculus Brca2 mRNA, complete cds; Similar to human breast cancer susceptibility gene BRCA2; Allele: wild type; putative tumor suppressor	1
230	AF001549	Homo sapiens chromosome 16 BAC clone CIT987SK-270G1 complete sequence.	0.07	PM22_HUMAN	PERIPHERAL MYELIN PROTEIN 22 (PMP-22)>PIR2:JN0503 peripheral myelin protein 22 - human>GP:HUMGAS 3X_1 Human peripheral myelin protein 22 (GAS3) mRNA, complete cds>GP:HUMPMP22_1 Human peripheral myelin protein 22 mRNA, complete cds>GP:HUMPMP22	0.0078
231	L36829	Mus musculus alphaA-crystallin-binding protein I (AlphaA-CRYBP1) gene, complete cds.	0.066	<NONE>	<NONE>	<NONE>
232	AC000159	*** SEQUENCING IN PROGRESS *** Human BAC Clone 11q13;	0.058	CEZK863_1	Caenorhabditis elegans cosmid ZK863, complete sequence; ZK863;2; Similar to collagen	1

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		HTGS phase 1, 10 unordered pieces.				
233	AC000159	*** SEQUENCING IN PROGRESS *** Human BAC Clone 11q13; HTGS phase 1, 10 unordered pieces.	0.058	CAC2_HAEC O	CUTICLE COLLAGEN 2C (FRAGMENT)>GP:H AECOL2C_1 H;contortus collagen 2C mRNA, 3'end	1.20E-08
234	Z23908	H. sapiens (D5S630) DNA segment containing (CA) repeat; clone AFM268zd9; single read.	0.057	VEU34999_1	Venezuelan equine encephalitis virus nonstructural and structural polyprotein genes, complete cds; Nonstructural polyprotein; Internal stop codon, readthrough occurs 5% of the time	0.0002
235	B21875	T3E8-Sp6 TAMU Arabidopsis thaliana genomic clone T3E8.	0.055	YRR2_CAEE L	HYPOTHETICAL 91.1 KD PROTEIN R144.2 IN CHROMOSOME III>GP:CELR144_7 Caenorhabditis elegans cosmid R144; Coded for by C; elegans cDNA CEESP84R; coded for by C; elegans cDNA yk23c4;5; coded for by C; elegans cDNA yk44f9;5; coded for by C; eleg	0.68
236	Z98303	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 140H19; HTGS phase 1.	0.048	AC002330_3	Arabidopsis thaliana BAC T10P11, complete sequence; Putative zinc-finger protein; C2H2 Zn-finger signature from position 80 to 100 [CEICNKGFRDQNL QLHRRGH]	0.99

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
237	D49911	Thermus thermophilus UvrA gene, complete cds.	0.044	APPI_MOUSE	AMYLOID-LIKE PROTEIN 1 PRECURSOR (APLP)>PIR2:A46362 amyloid precursor-like protein - mouse>GP:MUSAPLP_1 Mouse amyloid precursor-like protein mRNA, complete cds	8.90E-06
238	D49911	Thermus thermophilus UvrA gene, complete cds.	0.044	MMCOL18A1_1_2	Mus musculus alpha-1(XVIII) collagen (COL18A1) gene, exons 40-43, complete cds	1.60E-06
239	X78119	P.amygdalus, Batsch (Texas) prul mRNA.	0.042	CA44_HUMAN	COLLAGEN ALPHA 4(IV) CHAIN PRECURSOR>PIR1:CGHU1B collagen alpha 4(IV) chain precursor - human>GP:HSCOL4A4_1 H;sapiens mRNA for collagen type IV alpha 4 chain; Type IV collagen alpha 4 chain	2.00E-06
240	U72877	Rana catesbeiana L-epinephrine transporter mRNA, complete cds.	0.041	YRR6_MYCAA	HYPOTHETICAL 33.0 KD PROTEIN IN LICA 3'REGION (ORF R6)>PIR2:S42125 hypothetical protein 3 - Mycoplasma capricolum (SGC3)>GP:MYCRP MH_6 M; capricolum rpmH, mpA and licA gene; Orf R6	0.0008
241	L39891	Homo sapiens polycystic kidney disease-associated protein (PKD1) gene, complete cds.	0.04	MUC2_HUMAN	MUCIN 2 (INTESTINAL MUCIN 2) (FRAGMENTS)	5.90E-05
242	L40390	Candida glabrata ERG3 gene, complete cds.	0.039	G01763	atrophin-1 - human>GP:HSU23851_1 Human atrophin-1 mRNA, complete cds	9.00E-07

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
243	B28113	T2L16TRB TAMU Arabidopsis thaliana genomic clone T2L16.	0.038	CELZK1248_14	Caenorhabditis elegans cosmid ZK1248	1.60E-18
244	AC000030	00175, complete sequence.	0.033	ATFCA8_40	Arabidopsis thaliana DNA chromosome 4, ESSA I contig fragment No; 8; Glycerol-3-phosphate permease homolog; Similarity to glycerol-3-phosphate permease - Haemophilus influenzae	0.63
245	B10738	F13G15-Sp6 IGF Arabidopsis thaliana genomic clone F13G15.	0.032	D87521_1	Mus musculus DNA-PKcs mRNA, complete cds	0.21
246	AF024503	Caenorhabditis elegans cosmid F31F4.	0.03	I38344	titin - human	1
247	Z49888	Caenorhabditis elegans cosmid F47A4, complete sequence.	0.027	KSU52064_1	Kaposi's sarcoma-associated herpes-like virus ORF73 homolog gene, complete cds; Herpesvirus saimiri ORF73 homolog>GP:KSU756 98_78 Kaposi's sarcoma-associated herpesvirus long unique region, 80 putative ORF's and kaposin gene, complete cds; OR	3.40E-10
248	Z83822	Human DNA sequence from PAC 306D1 on chromosome X contains ESTs.	0.025	GRSB_BACB_R	GRAMICIDIN S SYNTHETASE II (GRAMICIDIN S BIOSYNTHESIS GRSB PROTEIN) (EC 6.-.-.)	1
249	Z94161	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone N102C10; HTGS	0.025	S16323	hypothetical protein - Arabidopsis thaliana>GP:ATHB1_1 A;thaliana homeobox gene Athb-1 mRNA; Open reading frame	0.0079

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		phase 1.				
250	AC002094	Genomic sequence from Human 17, complete sequence.	0.021	S57447	HPBR11-7 protein - human>GP:HSHPBR11 4_1 H;sapiens HPBR11-4 mRNA>GP:HSHPBR11 7_1 H;sapiens HPBR11-7 gene	8.20E-08
251	D79994	Human mRNA for KIAA0172 gene, partial cds.	0.021	CER10H10_1	Caenorhabditis elegans cosmid R10H10, complete sequence; R11A8;7; Protein predicted using Genefinder; Similarity to Mouse ankyrin (PIR Acc; No; S37771); cDNA EST CEESX25F comes from this gene;	7.00E-16
252	Z97635	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 438L4; HTGS phase 1.	0.017	CELW05H7_4	Caenorhabditis elegans cosmid W05H7	0.24
253	X84996	X.laevis mRNA for selenocysteine tRNA acting factor (Staf).	0.017	JN0786	integrin beta-4 chain precursor - mouse	0.088
254	AC002543	Human BAC clone RG300C03 from 7q31.2, complete sequence.	0.013	MZLMTCYT BT_1	Mendocellus isis mitochondrial NADH dehydrogenase, and cytochrome b genes, 3' end, and transfer RNA-Ser gene; This codes for the last 43 amino acids of NADH dehydrogenase subunit 1 followed	0.044

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
255	U10401	Caenorhabditis elegans cosmid T20B12.	0.012	MMMHC29N7_2	Mus musculus major histocompatibility locus class III region:butyrophilin-like protein gene, partial cds; Notch4, PBX2, RAGE, lysophatidic acid acyl transferase-alpha, palmitoyl-	0.069
256	L14593	Saccharomyces cerevisiae protein phosphatase (PTC1) gene, complete cds.	0.011	D86995_1	Human (gene 1) DNA for phosphatase 2C motif, partial cds	2.20E-14
257	U62317	Chromosome 22q13 BAC Clone CIT987SK-384D8 complete sequence.	0.0093	P2Y8_XENLA	P2Y PURINOCEPTOR 8 (P2Y8)>GP:XLP2Y8_1 X;laevis mRNA for P2Y8 nucleotide receptor	0.89
258	D29655	Pig mRNA for UMP-CMP kinase, complete cds.	0.0075	AF004858_1	Mus musculus platelet activating factor receptor mRNA, partial cds; PAF-receptor	1
259	AF002992	Homo sapiens cosmid from Xq28, complete sequence.	0.0054	FBN1_BOVIN	FIBRILLIN 1 PRECURSOR>PIR2:A55567 fibrillin I - bovine>GP:BOVXAA AA_1 Bos taurus mRNA, complete cds; Putative	0.0004
260	B20752	T19M2-T7 TAMU Arabidopsis thaliana genomic clone T19M2.	0.0043	HSV11EP_1	Feline herpesvirus type 1 gene for immediate early protein, complete cds; Feline herpesvirus type 1 immediate early protein	3.90E-05

Table 2

Nearest Neighbor (BlastN vs. Genbank)				Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
SEQ ID	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
261	AB006699	Arabidopsis thaliana genomic DNA, chromosome 5, P1 clone: MDJ22.	0.0037	YHV5_YEAS T	HYPOTHETICAL 143.6 KD PROTEIN IN SPO16-REC104 INTERGENIC REGION>PIR2:S4675 4 hypothetical protein YHR155w - yeast (Saccharomyces cerevisiae)>GPN:YSC H9666_15 Saccharomyces cerevisiae chromosome VIII cosmid 9666; Yhr155wp; Similar to Sip3p (Snf	0.077
262	Z99128	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 422H11; HTGS phase 1.	0.0032	ALU1_HUMAN	!!!! ALU SUBFAMILY J WARNING ENTRY !!!!	0.0087
263	B21848	T2D2-Sp6 TAMU Arabidopsis thaliana genomic clone T2D2.	0.0031	B31794	mdm-1 protein (clone c103) - mouse	1.00E-05
264	L33853	Human germline immunoglobulin kappa chain variable region (Vk-IV subgroup) for anti-B-amyloid autoantibodies in Alzheimer's disease.	0.0027	B45550	cytochrome b homolog - Plasmodium yoelii	0.99
265	B36863	HS-1042-A1-F01-MR.abi CIT Human Genomic Sperm Library C Homo sapiens genomic clone Plate=CT 824 Col=1 Row=K.	0.0027	YQK4_CAEE L	HYPOTHETICAL 64.3 KD PROTEIN C56G2.4 IN CHROMOSOME III>GP:CELC56G2_2 Caenorhabditis elegans cosmid C56G2	0.81

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
266	AC003041	*** SEQUENCING IN PROGRESS *** Homo sapiens chromosome 17, clone HCIT307A16; HTGS phase 1, 10 unordered pieces.	0.0024	GLB4_LAMS P	GIANT HEMOGLOBIN AIV CHAIN (FRAGMENT)>PIR2: S01810 hemoglobin AIV - tube worm (Lamellibrachia sp.) (fragment)	0.94
267	AC002315	Mouse BAC-146N21 Chromosome X contains iduronate-2-sulfatase gene; complete sequence.	0.0022	MG42_TARM A	SRY-RELATED PROTEIN MG42 (FRAGMENT)>PIR3:I 51369 Sry-related sequence - Tarentola mauritanica (fragment)>GP:TELM G42DNA_1 Gecko MG42 gene, partial cds; Sry-related sequence	0.99
268	AF016674	Caenorhabditis elegans cosmid C03H5.	0.0015	SCYJL204C_1	S;cerevisiae chromosome X reading frame ORF YJL204c	1
269	AF016674	Caenorhabditis elegans cosmid C03H5.	0.0015	CEM199_3	Caenorhabditis elegans cosmid M199, complete sequence; M199;e; Protein predicted using Genefinder; preliminary prediction	0.97
270	AF016674	Caenorhabditis elegans cosmid C03H5.	0.0015	CEM199_3	Caenorhabditis elegans cosmid M199, complete sequence; M199;e; Protein predicted using Genefinder; preliminary prediction	0.97
271	Z54199	L.esculentum DNA Ailsa craig encoding l-aminocyclopropane-1-carboxylic acid oxidase.	0.0015	CELF20A1_5	Caenorhabditis elegans cosmid F20A1; Coded for by C; elegans cDNA yk9g1;3; coded for by C; elegans cDNA yk9g1;5; coded for by C; elegans cDNA CEESU55F;	0.11

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
					weak similarity to putative	
272	Z99943	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 313L4; HTGS phase 1.	0.0014	CEK08F8_5	Caenorhabditis elegans cosmid K08F8, complete sequence; K08F8;5b	0.93
273	S81083	beta - ADD=adducin beta subunit 63 kda isoform/membrane skeleton protein, beta - ADD=adducin beta subunit 63 kda isoform/membrane skeleton protein {alternatively spliced, exon 10 to 13 region} [human, Genomic, 1851 nt, segment 3 of 3].	0.0013	MTCY277_7	Mycobacterium tuberculosis cosmid Y277; Unknown; MTCY277;07c, unknown, len: 302	0.0001
274	Z82174	Human DNA sequence from cosmid B20F6 on chromosome 22q11.2-qter.	0.001	FBLA_HUMAN	FIBULIN-1, ISOFORM A PRECURSOR>GP:HS FIBUA_1 H;sapiens mRNA for fibulin-1 A	0.00063
275	Z82215	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 68O2; HTGS phase 1.	0.00079	BFR1_SCHPO	BREFELDIN A RESISTANCE PROTEIN>PIR2:S522 39 hba2 protein - fission yeast (Schizosaccharomyces pombe)>GP:SPHBA2 GEN_1 S;pombe hba2 gene	0.15

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
276	U28153	Caenorhabditis elegans UNC-76 (unc-76) gene, complete cds.	0.00071	CX2_HEMHA	CYTOTOXIN 2 (TOXIN 12A)	0.32
277	Z82204	Human DNA sequence from clone J362G171.	0.00054	DMU34925_2	Drosophila melanogaster DNA repair protein (mei-41) gene, complete cds, and TH1 gene, partial cds	0.045
278	AC002530	Human BAC clone RG341D10 from 7p15-p21, complete sequence.	0.00053	CELT28F2_2	Caenorhabditis elegans cosmid T28F2; Weak similarity to HSP90	0.037
279	U91322	Human chromosome 16p13 BAC clone CIT987SK-276F8 complete sequence.	0.00051	CEW08D2_2	Caenorhabditis elegans cosmid W08D2, complete sequence; W08D2;3; Protein predicted using Genefinder>GP:CEW08D2_2 Caenorhabditis elegans cosmid W08D2; W08D2;3; Protein predicted using Genefinder	0.26
280	D16986	Human HepG2 partial cDNA, clone hmd2b09m5.	0.00037	POLG_PPVN A	GENOME POLYPROTEIN (CONTAINS: N-TERMINAL PROTEIN; HELPER COMPONENT PROTEINASE (EC 3.4.22.-) (HC-PRO); 42-50 KD PROTEIN; CYTOPLASMIC INCLUSION PROTEIN (CI); 6 KD PROTEIN; NUCLEAR INCLUSION PROTEIN A (NI- A) (EC 3.4.22.-) (49K PROTEINASE) (49	0.48
281	U91318	Human chromosome 16p13 BAC clone CIT987SK-962B4 complete	0.00031	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		sequence.				
282	M93406	Human dispersed Alu repeats and dispersed L1 repeat.	0.0003	VG8_SPV4	GENE 8 PROTEIN>PIR1:G8BP SV gene 8 protein - spiroplasma virus 4 (SGC3)	0.23
283	AC002398	Human DNA from chromosome 19-specific cosmid F25965, genomic sequence, complete sequence.	0.00021	HMCA_DROME	HOMEOTIC CAUDAL PROTEIN>PIR2:A263 57 homeotic protein Cad - fruit fly (Drosophila melanogaster)>GP:DR OCADA2_1 D;melanogaster caudal gene (cad) encoding a maternal and zygotic transcript, exon 2; Caudal protein>TFD:TFDP001 59 - Polypeptides en	0.021
284	AC002530	Human BAC clone RG341D10 from 7p15-p21, complete sequence.	0.0002	PL0009	complement C3d/Epstein-Barr virus receptor precursor - human	0.7
285	X01871	Yeast mitochondrial ori(o) repeat unit of petite mutant 5 (petite strain s-10/7/2).	0.00015	RVZMTCYT BT_1	Reventazonia sp; mitochondrial NADH dehydrogenase, and cytochrome b genes, 3' end, and transfer RNA-Ser gene; This codes for the last 43 amino acids of NADH dehydrogenase subunit 1 followed	0.73
286	U89984	Acanthamoeba castellanii transformation-sensitive protein homolog mRNA, complete cds.	0.00015	ACU89984_1	Acanthamoeba castellanii transformation-sensitive protein homolog mRNA, complete cds; Similar to human transformation-	4.20E-13

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
					sensitive protein: SwissProt Accession Number P31948	
287	AC002365	Homo sapiens chromosome X clone U177G4, U152H5, U168D5, 174A6, U172D6, and U186B3 from Xp22, complete sequence.	0.00011	S10340	DNA-directed RNA polymerase (EC 2.7.7.6) - yeast (<i>Kluyveromyces marxianus</i> var. <i>lactis</i>)	0.00062
288	AC002390	Human DNA from overlapping chromosome 19-specific cosmids R30072 and R28588, genomic sequence, complete sequence.	9.90E-05	D86603_1	Mouse mRNA for Bach protein 1, complete cds; Bach1	1
289	AC002980	Homo sapiens; HTGS phase 1, 34 unordered pieces.	9.20E-05	TRBKPCYB_1	<i>Trypanosoma brucei</i> kinetoplast apocytochrome b gene, complete cds	0.52
290	M99412	Human interleukin-8 receptor (IL8RB) gene, complete cds.	4.50E-05	S28832	microtubule-associated protein H1 (clone KS3.1) - longfin squid (fragment)	0.88
291	AC000120	Human BAC clone RG161K23 from 7q21, complete sequence.	4.00E-05	SXSCRBA_1	<i>Sxylosus</i> scrB and scrR genes; Sucrose repressor	0.99

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
292	AC003037	Homo sapiens; HTGS phase 1, 66 unordered pieces.	3.40E-05	S13569	hypothetical protein 5 - Lactococcus lactis subsp. lactis insertion sequence 1076>GP:LLTLE_1 Lactococcus lactis DNA for the transposon-like element on the lactose plasmid; ORF5 (AA 1 - 43)	0.018
293	Z81512	Caenorhabditis elegans cosmid F25C8, complete sequence.	2.40E-05	MUSDBPRC_1	Mus musculus DNA-binding protein Rc mRNA, complete cds; DNA binding protein Rc	1
294	B16681	343C3.TVB CIT978SKA1 Homo sapiens genomic clone A-343C03.	1.10E-05	COPP_YEAS_T	COATOMER BETA' SUBUNIT (BETA'-COAT PROTEIN) (BETA'-COP)>PIR2:B55123 coatomer complex beta' chain - yeast (Saccharomyces cerevisiae)>GPN:SCY GL137W_1 S;cerevisiae chromosome VII reading frame ORF YGL137w>GP:SCU11 237_1 Saccharomyces cerevisiae	0.081
295	Z16523	H. sapiens (D9S158) DNA segment containing (CA) repeat; clone AFM073yb11; single read.	1.00E-05	MMSEMF_1	M;musculus mRNA for semaphorin F; Smaphorin F	0.78
296	Z49704	S.cerevisiae chromosome XIII cosmid 8021.	5.60E-06	<NONE>	<NONE>	<NONE>
297	AC003071	Human BAC clone BK085E05 from 22q12.1-qter, complete sequence.	3.00E-06	HSRCAER_1	H;sapiens mRNA for red cell anion exchanger (EPB3, AE1, Band 3) 3' non-coding region	0.21

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
298	U20428	Human SNC19 mRNA sequence.	1.40E-06	HUMMUC2A_1	Human mucin-2 gene, partial cds	4.40E-06
299	U51903	Human RasGAP-related protein (IQGAP2) mRNA, complete cds.	6.60E-07	IQGA_HUMAN	RAS GTPASE-ACTIVATING-LIKE PROTEIN IQGAP1 (P195)>PIR2:A54854 Ras GTPase activating-related protein - human>GP:HUMIQGA_1 Homo sapiens ras GTPase-activating-like protein (IQGAP1) mRNA, complete cds; Amino acid feature: IQ calmodulin-binding do	1.60E-14
300	AL000805	F.rubripes GSS sequence, clone 021G08aA1.	4.70E-07	MT13_MYTED	METALLOTHIONEIN 10-III (MT-10-III)>PIR2:S39418 metallothionein 10-III - blue mussel	2.20E-10
301	AC003016	Human BAC clone RG134C19 from 8q21, complete sequence.	4.30E-07	SPC57A10_5	S;pombe chromosome I cosmid c57A10; Unknown; SPAC57A10;05;c, unknown, len:606aa, similar to A; nidulans Q00659, sulfur metabolite repression control, (678aa), fasta scores, opt:1355,	0.00041
302	AC003089	Human BAC clone RG180F08A, complete sequence.	3.80E-07	HPBPRECK_1	Hepatitis B virus type 11 precore protein (pre-C region, C) gene, 5' end	0.41
303	AC002074	Human BAC clone GS056H18 from 7q31-q32, complete sequence.	2.40E-07	A47021_1	Sequence 23 from Patent WO9527787; Unnamed protein product; Author-given protein sequence is in conflict with the conceptual translation>GP:A51260_1 Sequence 23 from Patent WO9614416; Unnamed protein product; Author-given	0.0016

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
					protein sequence is i	
304	U04980	Rattus norvegicus fetal troponin T 3 (fetal TnT3) mRNA, partial cds.	2.20E-07	HUMFSHD_1	Human facioscapulohumeral muscular dystrophy (FSHD) gene region, D4Z4 tandem repeat unit; ORF	3.30E-08
305	U68704	Human chromosome 21q22.3 P1-clone 3804 subclone 4-52.	2.00E-07	HHV6AGNM_96	Human herpesvirus-6 (HHV-6) U1102, variant A, complete virion genome; U88; Cys repeats; this loci is open in all six reading frames, part of IE-A	2.70E-05
306	U51583	Rattus norvegicus zinc finger homeodomain enhancer-binding protein-1 (Zfhep-1) mRNA, partial cds.	8.70E-08	AF005370_67	Alcelaphine herpesvirus 1 L-DNA, complete sequence; Putative immediate early protein; ORF73; similar to H; saimiri and KSHV ORF73	6.10E-07
307	M80206	Mus domesticus poliovirus receptor homolog (MPH) mRNA, complete cds.	8.10E-08	I53960	PRR2 alpha - human	1.70E-28
308	M60854	Human ribosomal protein S16 mRNA, complete cds.	5.70E-08	OLVPOL_1	Caprine arthritis encephalitis virus (isolate OVLV-N1) pol protein gene, 3' end of cds; Nt 2497-2695 from CAEV Co	0.27
309	U82828	Homo sapiens ataxia telangiectasia (ATM) gene, complete cds.	1.50E-08	C40201	artifact-warning sequence (translated ALU class C) - human	0.00044

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
310	Z83836	Human DNA sequence from PAC 111J24 on chromosome 22q12-qter contains ESTs.	1.40E-08	HSU64473_1	Human rheumatoid arthritis synovium immunoglobulin heavy chain variable region mRNA, partial cds>GP:HSU64498_1 Human rheumatoid arthritis synovium immunoglobulin heavy chain variable region mRNA, partial cds	0.34
311	Z50029	Caenorhabditis elegans cosmid ZC504, complete sequence.	1.40E-08	MMU88984_1	Mus musculus NIK mRNA, complete cds	1.70E-50
312	AC002351	Homo sapiens; HTGS phase 1, 17 unordered pieces.	1.20E-08	D41132	collagen-related protein 4 - Hydra magnipapillata (fragment)>PIR2:S219 32 mini-collagen - Hydra sp.>GP:HSNCOL4_1 Hydra N-COL 4 mRNA for mini-collagen; No start codon	0.02
313	B65763	CIT-HSP-2023A12.TR CIT-HSP Homo sapiens genomic clone 2023A12.	3.60E-09	S18106	type II site-specific deoxyribonuclease (EC 3.1.21.4) AhrI - Azospirillum brasilense	0.045
314	Z93021	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 516C23; HTGS phase 1.	2.00E-09	AB001684_13 4	Chlorella vulgaris C-27 chloroplast DNA, complete sequence; RNA polymerase gamma subunit	0.6
315	D88035	Rat mRNA for glycoprotein specific UDP-glucuronyltransferase, complete cds.	1.50E-09	D88035_1	Rat mRNA for glycoprotein specific UDP-glucuronyltransferase, complete cds	1.00E-33

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
316	U85193	Human nuclear factor I-B2 (NFIB2) mRNA, complete cds.	1.30E-10	VGF1_IBVB	F1 PROTEIN>PIR1:VFIH B1 F1 protein - avian infectious bronchitis virus (strain Beaudette)>GP:IBACG B_1 Avian infectious bronchitis virus pol protein, spike protein, small virion-associated protein, membrane protein, and nucleocapsid protein gen	1
317	B04719	cSRL-42G12-u cSRL flow sorted Chromosome 11 specific cosmid Homo sapiens genomic clone cSRL-42G12.	7.90E-11	JC5238	galactosylceramide-like protein, GCP - human	0.31
318	M73506	Mouse Tcp-10c (t allele) gene.	2.80E-11	A39487	T-complex protein 10a (allele 129) - mouse	4.10E-16
319	U71148	Human Xq28 cosmids U225B5 and U236A12, complete sequence.	1.20E-11	A56547	sex-peptide precursor - Drosophila suzukii	0.4
320	Z95116	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 57G9; HTGS phase 1.	9.90E-13	ALU2_HUMAN	!!!! ALU SUBFAMILY SB WARNING ENTRY !!!!	0.0017
321	M64795	Rat MHC class I antigen gene (RT1-u haplotype), complete cds.	1.70E-14	STC_DROME	SHUTTLE CRAFT PROTEIN>GP:DMU0 9306_1 Drosophila melanogaster shuttle craft protein (stc) mRNA, complete cds; C-terminal 222 amino acids encode a novel single- stranded DNA binding domain	1.40E-13

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
322	Y09036	H.sapiens NTRK1 gene, exon 17.	4.20E-15	AF010403_1	Homo sapiens ALR mRNA, complete cds; Alternatively spliced; similarity to ALL-1 and Drosophila trithorax	1
323	U12523	Rattus norvegicus ultraviolet B radiation-activated UV98 mRNA, partial sequence.	2.90E-15	SPBC30D10_4	S;pombe chromosome II cosmid c30D10; Hypothetical protein; SPBC30D10;04, unknown, len:148aa	2.40E-09
324	Z98755	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 76C18; HTGS phase 1.	2.20E-15	RPON_HAL MA	DNA-DIRECTED RNA POLYMERASE SUBUNIT N (EC 2.7.7.6)>PIR2:D41715 DNA-directed RNA polymerase II chain RPB10 homolog - Haloarcula marismortui>GP:HAL HMAENOA_4 H;marismortui tRNA-Leu, HL29, HmaL13, HmaS9, OrfMMV, OrfMNA, 2-phosphoglycerate dehydr	0.019
325	M86917	Human oxysterol-binding protein (OSBP) mRNA, complete cds.	1.60E-15	CEF14H8_2	Caenorhabditis elegans cosmid F14H8, complete sequence; F14H8;1; Similarity to Human oxysterol-binding protein (SW:OXYB_HUMAN)	2.10E-18
326	AC001231	Genomic sequence from Human 17, complete sequence.	1.30E-15	AC002397_3	Mouse BAC284H12 Chromosome 6, complete sequence; DRPLA	0.0016
327	AL008626	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 1114G22; HTGS phase 1.	5.30E-16	TAU48227_1	Triticum aestivum soluble starch synthase mRNA, partial cds	5.90E-05

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
328	L04483	Human ribosomal protein S21 (RPS21) mRNA, complete cds.	7.60E-17	RS21_HUMAN	40S RIBOSOMAL PROTEIN S21>PIR2:S34108 ribosomal protein S21 - human>GP:SSZ84015_1 S;scrofa mRNA; expressed sequence tag (3'; clone c11g10); 40S ribosomal protein S21; Similar to human 40S ribosomal protein S21>GP:HUMRPS21X_1 Human ribosomal	1.40E-09
329	AB001899	Homo sapiens PACE4 gene, exon 2.	6.70E-17	LRP1_HUMAN	LOW-DENSITY LIPOPROTEIN RECEPTOR-RELATED PROTEIN 1 PRECURSOR (LRP) (ALPHA-2-MACROGLOBULIN RECEPTOR) (A2MR) (APOLIPOPROTEIN E RECEPTOR) (APOER)>PIR2:S02392 LDL receptor-related protein precursor - human>GP:HSLDLRR L_1 Human mRNA for LDL-recept	1
330	Z98755	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 76C18; HTGS phase 1.	4.40E-17	U97553_59	Murine herpesvirus 68 strain WUMS, complete genome; Ribonucleotide reductase large	0.06
331	AF017187	Homo sapiens LTR HERV-K repetitive element fragment ltr_19_9a sequence.	3.90E-18	D84255_1	Ovophis okinavensis mitochondrial DNA for NADH dehydrogenase subunit 1, partial cds, Ile-tRNA, Pro-tRNA, Phe-tRNA, Gln- tRNA, Met-tRNA and control region (D-loop region); This cds	0.007

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
332	B36252	HS-1038-A2-G01-MR.abi CIT Human Genomic Sperm Library C Homo sapiens genomic clone Plate=CT 820 Col=2 Row=M.	3.10E-18	PGBM_MOUSE	BASEMENT MEMBRANE-SPECIFIC HEPARAN SULFATE PROTEOGLYCAN CORE PROTEIN PRECURSOR (HSPG) (PERLECAN) (PLC)>PIR2:S18252 heparan sulfate proteoglycan - mouse>GP:MUSPERP A_1 Mouse perlecan mRNA, complete cds	0.00015
333	D78255	Mouse mRNA for PAP-1, complete cds.	2.70E-18	MUSPAP1_1	Mouse mRNA for PAP-1, complete cds	3.50E-18
334	AC003046	Human Xp22 PACs RPC11-263P4 and RPC11-164K3 complete sequence.	1.40E-18	CEC34F6_1	Caenorhabditis elegans cosmid C34F6; C34F6;1; CDNA EST yk46b12;5 comes from this gene; cDNA EST yk44c4;5 comes from this gene; cDNA EST yk46b12;3 comes from this gene	0.0015
335	AC003002	Human DNA from overlapping chromosome 19-specific cosmids R29515 and R28253, genomic sequence, complete sequence.	1.40E-18	MUSZFP0_1	Mouse mRNA for zinc finger protein, partial sequence	1.30E-19
336	Y15054	Rattus norvegicus mRNA for 70 kDa tumor specific antigen, partial.	3.40E-19	HS4U2IR2_1	Epstein-Barr virus (AG876 isolate) U2-IR2 domain encoding nuclear protein EBNA2, complete cds; Nuclear antigen 2	2.00E-06
337	Z97876	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 295C6; HTGS	1.30E-19	AF003535_1	Homo sapiens L1 element ORF2-like protein gene, partial cds	7.00E-05

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		phase 1.				
338	M97159	Mouse (clone pIL2) B1 dispersed repeat unit.	1.10E-19	A26882	pIL2 hypothetical protein - rat (fragment)>GP:RATT DR_1 Rat growth and transformation-dependent mRNA, 3' end; Growth and transformation dependent protein	0.2
339	U30817	Bos taurus very-long-chain acyl-CoA dehydrogenase mRNA, nuclear gene encoding mitochondrial protein, complete cds.	4.70E-20	ACDV_RAT	ACYL-COA DEHYDROGENASE, VERY-LONG-CHAIN SPECIFIC PRECURSOR (EC 1.3.99.-) (VLCAD)>PIR2:A548 72 acyl-CoA dehydrogenase (EC 1.3.99.-) very-long-chain-specific precursor - rat>GP:RATVLCAD_1 Rat mRNA for very-long-chain Acyl-CoA dehydrogenase, compl	8.10E-25
340	Y11535	H.sapiens mRNA for SHOXb protein.	2.80E-20	ALU1_HUMAN	!!!! ALU SUBFAMILY J WARNING ENTRY !!!!	0.00027
341	AL008730	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 487J7; HTGS phase 1.	7.10E-21	C40201	artifact-warning sequence (translated ALU class C) - human	0.001
342	U96629	Human chromosome 8 BAC clone CIT987SK-2A8 complete sequence.	5.30E-23	ALU1_HUMAN	!!!! ALU SUBFAMILY J WARNING ENTRY !!!!	3.80E-10

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
343	U95743	Homo sapiens chromosome 16 BAC clone CIT987-SK65D3, complete sequence.	2.10E-24	UROM_HUMAN	UROMODULIN PRECURSOR (TAMM-HORSFALL URINARY GLYCOPROTEIN) (THP)>PIR2:A30452 uromodulin precursor - human>GP:HUMUMOD_1 Human uromodulin (Tamm-Horsfall glycoprotein) mRNA, complete cds; Uromodulin precursor	1
344	U15972	Mus musculus homeobox (Hoxa7) gene, complete cds.	4.00E-25	S20790	extensin - almond>GP:PAEXTS_1 P;amygdalus mRNA for extensin	0.34
345	U15972	Mus musculus homeobox (Hoxa7) gene, complete cds.	4.00E-25	CA24_CAEE L	COLLAGEN ALPHA 2(IV) CHAIN PRECURSOR>GP:CECOLA2IV_2 C;elegans a2(IV) collagen gene; Alternatively spliced transcript	0.1
346	Z66242	H.sapiens CpG island DNA genomic MseI fragment, clone 84a4, reverse read cpg84a4.r1a.	4.80E-26	CEC35A5_8	Caenorhabditis elegans cosmid C35A5, complete sequence; C35A5;8; CDNA EST yk31f6;5 comes from this gene; cDNA EST yk38h1;3 comes from this gene; cDNA EST yk38h1;5 comes from this gene;	7.70E-19
347	L25331	Rattus norvegicus lysyl hydroxylase mRNA, complete cds.	3.90E-26	LYSH_CHICK	PROCOLLAGEN-LYSINE,2-OXOGLUTARATE 5-DIOXYGENASE PRECURSOR (EC 1.14.11.4) (LYSYL HYDROXYLASE)>PIR2:A23742 procollagen-lysine 5-dioxygenase (EC 1.14.11.4) precursor - chicken>GP:CHKLYH_1 Chicken lysyl	1.10E-43

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
					hydroxylase mRNA, complete cds	
348	L81569	Drosophila melanogaster (subclone 2_d7 from P1 DS04260 (D68)) DNA sequence, complete sequence.	3.30E-26	CEL52B9_2	Caenorhabditis elegans cosmid C52B9; Coded for by C; elegans cDNA cm11d6; weakly similar to S; cervisiae PTM1 precursor (SP:P32857)	8.40E-29
349	U78082	Human RNA polymerase transcriptional regulation mediator (h-MED6) mRNA, complete cds.	2.30E-26	HSU78082_1	Human RNA polymerase transcriptional regulation mediator (h-MED6) mRNA, complete cds; H-Med6p	1.50E-16
350	U43381	Human Down Syndrome region of chromosome 21 DNA.	2.10E-28	HSMRNAEB_1	H;sapiens genomic DNA, integration site for Epstein-Barr virus; Hypothetical protein	0.18
351	D50416	Mouse mRNA for AREC3, complete cds.	2.50E-29	A29947	prostaglandin-endoperoxide synthase (EC 1.14.99.1) precursor - sheep>GP:SHPCOA_1 Sheep prostaglandin endoperoxide synthetase (cyclooxygenase), complete cds; Cyclooxygenase precursor (EC 1;14;99;1)	0.81

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
352	U85193	Human nuclear factor I-B2 (NFIB2) mRNA, complete cds.	2.20E-29	CFU30222_1	Crithidia fasciculata fully edited ATPase subunit 6 (MURF4) mRNA, partial cds; Cryptogene	0.53
353	Z92826	Caenorhabditis elegans DNA *** SEQUENCING IN PROGRESS *** from clone C18D11; HTGS phase 1.	1.10E-30	SPAC1B3_5	S;pombe chromosome I cosmid c1B3; Hypothetical protein; SPAC1B3;05, probable transcriptional regulator, len:630aa, similar eg; to YIL038C, NOT3_YEAST, P06102, general negative regulator,	3.20E-35
354	L09604	Homo sapiens differentiation-dependent A4 protein mRNA, complete cds.	3.70E-32	PVU72769_1	Phaseolus vulgaris PvPRP-12 (Pvprp1-12) mRNA, partial cds; Similar to cell wall proline rich protein>GP:PVU72769_1 Phaseolus vulgaris PvPRP-12 (Pvprp1-12) mRNA, partial cds; Similar to cell wall proline rich protein	0.00049
355	B42455	HS-1055-B2-G03-MR.abi CIT Human Genomic Sperm Library C Homo sapiens genomic clone Plate=CT 777 Col=6 Row=N.	1.30E-32	CEL T05H4_8	Caenorhabditis elegans cosmid T05H4; Similar to the beta transducin family; coded for by C; elegans cDNA yk156e11;3; coded for by C; elegans cDNA yk14c8;3; coded for by C; elegans cDNA	6.90E-14
356	AF001905	Homo sapiens cosmids E079, B0920 and A8 from Xq25 X-linked lymphoproliferative disease gene candidate region, complete sequence.	1.80E-33	I38344	titin - human	1

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
357	E03743	DNA sequence including male hormone dependent gene derived from hamster frankorgan.	1.10E-34	CELCO3A7_2	Caenorhabditis elegans cosmid C03A7; Weak similarity to serotonin receptors	0.59
358	U31199	Human laminin gamma2 chain gene (LAMC2), exon 22 and flanking sequences.	1.20E-35	B44018	laminin B2t chain - human>GP:HSLAMB2 TB_1 H;sapiens mRNA for laminin	1.20E-14
359	D14678	Human mRNA for kinesin-related protein, partial cds.	2.00E-36	D49544_1	Mouse mRNA for KIFC1, complete cds	1.20E-23
360	AB000425	Porcine DNA for endopeptidase 24.16, exon 16 and complete cds.	8.20E-38	POL4_DROM E	RETROVIRUS-RELATED POLYPROTEIN (PROTEASE (EC 3.4.23.-); REVERSE TRANSCRIPTASE (EC 2.7.7.49); ENDONUCLEASE) (TRANSPONSON 412)>PIR1:GNFF42 retrovirus-related pol polyprotein - fruit fly (Drosophila melanogaster) transposon 412>GP:DMRT412G_4	0.65
361	U39875	Rattus norvegicus EF-hand Ca2+-binding protein p22 mRNA, complete cds.	8.80E-42	I56333	apolipoprotein B - rat (fragment)>GP:RATA POLPB_1 Rattus norvegicus (clone rb9E) apolipoprotein B apoB mRNA, 3' end	0.23

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
362	L09647	Rattus norvegicus hepatocyte nuclear factor 3a (HNF-3 beta) mRNA, complete cds.	6.60E-42	HN3B_RAT	HEPATOCYTE NUCLEAR FACTOR 3-BETA (HNF-3B)>GP:RATHNF3B_1 Rattus norvegicus hepatocyte nuclear factor 3a (HNF-3 beta) mRNA, complete cds>TFD:TFDP01611 - Polypeptides entry for factor HNF-3 (beta)	8.10E-25
363	D25538	Human mRNA for KIAA0037 gene, complete cds.	4.10E-43	CEL34D4_1 2	Caenorhabditis elegans cosmid C34D4	0.018
364	Z56764	H.sapiens CpG island DNA genomic MseI fragment, clone 13f7, reverse read cpg13f7.rt1a.	1.40E-43	S75263	hypothetical protein - Synechocystis sp. (PCC 6803)>GP:D90904_29 Synechocystis sp; PCC6803 complete genome, 6/27, 630555-781448; Hypothetical protein; ORF_ID:sl0983	0.0028
365	AC002636	*** SEQUENCING IN PROGRESS *** Drosophila melanogaster (subclone 2_g4 from P1 DS03323 (D127)) DNA sequence; HTGS phase 2.	8.40E-44	DMU95760_1	Drosophila melanogaster strawberry notch (sno) mRNA, complete cds; Notch pathway component; nuclear protein	3.40E-51
366	J05499	Rattus norvegicus L-glutamine amidohydrolase mRNA, complete cds.	8.00E-44	GLSL_RAT	GLUTAMINASE, LIVER ISOFORM PRECURSOR (EC 3.5.1.2) (GLS)>GP:RATGAH_1 Rattus norvegicus L-glutamine amidohydrolase mRNA, complete cds	8.00E-29

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
367	U95760	Drosophila melanogaster strawberry notch (sno) mRNA, complete cds.	5.00E-45	DMU95760_1	Drosophila melanogaster strawberry notch (sno) mRNA, complete cds; Notch pathway component; nuclear protein	4.80E-45
368	L10106	Mus musculus protein tyrosine phosphate mRNA, complete cds.	4.10E-45	PTPK_HUMAN	PROTEIN-TYROSINE PHOSPHATASE KAPPA PRECURSOR (EC 3.1.3.48) (R-PTP-KAPPA)>GP:HSPTPK AP_1 H;sapiens mRNA for phosphotyrosine phosphatase kappa; Human phosphotyrosine phosphatase kappa	4.70E-16
369	D17218	Human HepG2 3' region MboI cDNA, clone hmd3g02m3.	9.40E-47	MMU53563_1	Mus musculus Brg1 mRNA, partial cds; N-terminal region of the protein	0.00012
370	U78310	Homo sapiens pescadillo mRNA, complete cds.	8.10E-48	HSU78310_1	Homo sapiens pescadillo mRNA, complete cds	1.10E-21
371	AC000399	Genomic sequence from Mouse 9, complete sequence.	7.40E-48	KIP2_YEAST	KINESIN-LIKE PROTEIN KIP2>PIR1:C42640 kinesin-related protein KIP2 - yeast (Saccharomyces cerevisiae)>GP:SCKIP 2XVI_2 S;cerevisiae PEP4 and KIP2 genes encoding PEP4 proteinase (partial) and kinesin-related protein KIP2>GP:SCLACHX VI_17 S;cerev	0.14
372	AC002327	*** SEQUENCING IN PROGRESS *** Genomic sequence from Mouse 7; HTGS phase 1, 3	1.40E-48	CHKC1A205_1	Chicken alpha-2 type-1 collagen; amino acids - 16 to 3; Precollagen alpha-2	0.024

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		unordered pieces.				
373	X67016	H.sapiens mRNA for amphiglycan.	9.00E-49	CED2085_2	Caenorhabditis elegans cosmid D2085, complete sequence; D2085;1; Similar to glutamine-dependent carbamoyl-phosphate synthase, aspartate carbamoyltransferase, dihydroorotase; cDNA EST cm16f3>GP:CED2085_2 Caenorhabditis elegans cosmid D2085; D	0.14
374	L10409	Mouse fork head related protein (HNF-3beta) mRNA, complete cds.	1.50E-49	MMU04197_1	Mus musculus HNF3 beta transcription factor (HNF3b) mRNA, partial cds; Sequence of this partial cDNA begins in the first third of the conserved HNF3/forkhead DNA binding domain	1.20E-30
375	U01139	Mus musculus B6D2F1 clone 2C11B mRNA.	1.20E-49	SPBC3D5_14	S;pombe chromosome II cosmid c3D5; Unknown; SPBC3D5;14c, unknown; partial; serine rich, len:309aa, similar eg; to YNL283C, YN23_YEAST, P53832, hypothetical 52;3 kd protein, (503aa),	0.00091
376	Z82170	Human DNA sequence from PAC 326L13 containing brain-4 mRNA ESTs and polymorphic CA repeat.	9.00E-50	BSU55043_3	Bacillus subtilis plasmid pPOD2000 Rep, RapAB, RapA, ParA, ParB, and ParC genes, complete cds; ORF3	0.025

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
377	Z99289	Human DNA sequence *** SEQUENCING IN PROGRESS *** from clone 142L7; HTGS phase 1.	7.70E-50	A64431	hypothetical protein MJ1050 - Methanococcus jannaschii>GP:MJU67 548_2 Methanococcus jannaschii from bases 986219 to 996377 (section 90 of 150) of the complete genome; M; jannaschii predicted coding region MJ1050; Identified by GeneMark; putativ	5.60E-05
378	X98260	H.sapiens mRNA for M-phase phosphoprotein, mpp11.	6.20E-50	ZRF1_MOUSE	ZUOTIN RELATED FACTOR>GP:MMU53 208_1 Mus musculus zuotin related factor (ZRF1) mRNA, complete cds; Similar to DnaJ encoded by GenBank Accession Number L16953	3.90E-30
379	M18981	Human prolactin receptor-associated protein (PRA) gene, complete cds.	9.00E-52	S106_HUMAN	CALCYCLIN (PROLACTIN RECEPTOR ASSOCIATED PROTEIN) (PRA) (GROWTH FACTOR-INDUCIBLE PROTEIN 2A9) (S100 CALCIUM-BINDING PROTEIN A6)>PIR1:BCHUY calcyclin - human>GP:HUMCACY_1 Human calcyclin gene, complete cds>GP:HUMCACYA_1 Human prolactin recept	8.80E-24
380	AB006622	Homo sapiens mRNA for KIAA0284 gene, partial cds.	1.60E-53	S33015	hypothetical protein - human herpesvirus 4	0.00088

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
381	U53225	Human sorting nexin 1 (SNX1) mRNA, complete cds.	1.80E-55	G02522	sorting nexin 1 - human>GP:HSU53225_1 Human sorting nexin 1 (SNX1) mRNA, complete cds	9.20E-50
382	Z92844	Human DNA sequence from PAC 435C23 on chromosome X. Contains ESTs.	6.50E-56	D14487_1	Lentinus edodes Le;MFB1 mRNA, complete cds	1
383	D87450	Human mRNA for KIAA0261 gene, partial cds.	4.30E-56	D87450_1	Human mRNA for KIAA0261 gene, partial cds; Similar to D;melanogaster parallel sister chromatids protein	4.30E-30
384	AC002301	*** SEQUENCING IN PROGRESS *** Human chromosome +16p11.2 BAC clone CIT987SK-A-328A3; HTGS phase 2, 1 ordered pieces.	9.80E-57	S62328	kinesin-like DNA binding protein KID - human>GP:HUMKID_1 Human mRNA for Kid (kinesin-like DNA binding protein), complete cds	2.60E-27
385	L29766	Homo sapiens epoxide hydrolase (EPHX) gene, complete cds.	7.30E-57	HSBCTCF4_1	Homo sapiens mRNA for hTCF-4	2.30E-05
386	U58884	Mus musculus SH3-containing protein SH3P7 mRNA, complete cds. similar to Human Drebrin.	3.30E-58	MMU58884_1	Mus musculus SH3-containing protein SH3P7 mRNA, complete cds; similar to Human Drebrin; SH3-containing protein; similar to human drebrin	6.00E-43
387	Y15054	Rattus norvegicus mRNA for 70 kDa tumor specific antigen, partial.	9.50E-59	RNY15054_1	Rattus norvegicus mRNA for 70 kDa tumor specific antigen, partial; 70 kD tumor-specific antigen	4.70E-45

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
388	AC000406	*** SEQUENCING IN PROGRESS *** Human Chromosome 11 overlapping pacs pDJ235k10 and pDJ239b22; HTGS phase 1, 17 unordered pieces.	7.40E-59	<NONE>	<NONE>	<NONE>
389	L42612	Homo sapiens keratin 6 isoform K6f (KRT6F) mRNA, complete cds.	3.60E-59	KRHUEA	keratin, type II cytoskeletal - human (fragment)>GP:HSKE RA_1 Human messenger fragment encoding cytoskeletal keratin (type II); mRNA from cultured epidermal cells from human foreskin>GP:HUMKE R56K_1 Human 56k cytoskeletal type II keratin mRNA	7.60E-30
390	L29766	Homo sapiens epoxide hydrolase (EPHX) gene, complete cds.	2.70E-60	EGR2_HUMAN	EARLY GROWTH RESPONSE PROTEIN 2 (EGR-2) (KROX-20 PROTEIN) (AT591)>GP:HUMEG R2A_1 Human early growth response 2 protein (EGR2) mRNA, complete cds>TFD:TFDP00485 - Polypeptides entry for factor Egr-2	7.80E-06
391	L08758	Mus musculus homeobox protein (Hox A10) gene, 5' end of cds.	1.40E-60	PAALGYGE N_1	P;aeruginosa algY gene; Alginate lyase	0.00031
392	I29058	Sequence 3 from patent US 5576423.	4.20E-61	JC5106	stromal cell-derived factor 2 - human>GP:D50645_1 Human mRNA for SDF2, complete cds; Stroma cell-derived	1.50E-32

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
					factor-2	
393	I29058	Sequence 3 from patent US 5576423.	4.20E-61	JC5106	stromal cell-derived factor 2 - human>GP:D50645_1 Human mRNA for SDF2, complete cds; Stroma cell-derived factor-2	1.50E-32
394	U46067	Capra hircus beta-mannosidase mRNA, complete cds.	1.90E-62	CHU46067_1	Capra hircus beta-mannosidase mRNA, complete cds	2.70E-39
395	U40747	Mus musculus formin binding protein 11 mRNA, partial cds.	6.90E-63	S64713	formin binding protein 11 - mouse (fragment)>GP:MMU40747_1 Mus musculus formin binding protein 11 mRNA, partial cds; FBP 11; Formin binding protein 11; tandem WWP/WW domains separated by 15 amino acid linker	3.00E-46
396	M36164	Human glyceraldehyde-3-phosphate dehydrogenase mRNA, 3' flank.	1.10E-63	BHT1UL_12	Bovine herpesvirus type 1 UL22-35 genes; UL26;5>GP:BHU31809_2 Bovine herpesvirus 1 maturational proteinase (UL26) gene, complete cds, and scaffold protein (UL26;5) gene, complete cds	0.003
397	Y09036	H.sapiens NTRK1 gene, exon 17.	7.30E-65	MMU39060_1	Mus musculus glucocorticoid receptor interacting protein 1 (GRIP1) mRNA, complete cds; Hormone-dependent interaction with hormone binding domains of steroid receptors;	0.0054

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
					transactivation	
398	U17901	Rattus norvegicus phospholipase A-2-activating protein (plap) mRNA, complete cds.	2.70E-70	JC4239	phospholipase A2-activating protein - rat	8.40E-17
399	D12646	Mouse kif4 mRNA for microtubule-based motor protein KIF4, complete cds.	1.70E-74	KIF4_MOUSE	KINESIN-LIKE PROTEIN KIF4>PIR2:A54803 microtubule-associated motor KIF4 - mouse>GP:MUSKIF4_1 Mouse kif4 mRNA for microtubule-based motor protein KIF4, complete cds; ATP-binding site: base980-1037, motor domain: base732-1781, alpha-helical co	1.10E-44
400	AF007860	Xenopus laevis xl-Mago mRNA, complete cds.	4.60E-75	AF007862_1	Mus musculus mm-Mago mRNA, complete cds; Similar to Drosophila melanogaster Mago protein	6.50E-68
401	145565	Sequence 15 from patent US 5637463.	2.30E-82	RNU57391_1	Rattus norvegicus FceRI gamma-chain interacting protein SH2- B (SH2-B) mRNA, complete cds; Putative FceRI gamma ITAM interacting protein; SH2 domain-containing protein B; Method: conceptual	9.90E-42

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
402	U29156	Mus musculus eps15R mRNA, complete cds.	1.00E-85	MMU29156_1	Mus musculus eps15R mRNA, complete cds; Involved in signaling by the epidermal growth factor receptor; Method: conceptual translation supplied by author	4.90E-62
403	U70139	Mus musculus putative CCR4 protein mRNA, partial cds.	1.00E-85	MMU70139_1	Mus musculus putative CCR4 protein mRNA, partial cds; Similar to yeast transcription factor CCR4; transcriptional readthrough occurs with transcription being initiated at the IAP and continues	7.20E-66
404	U82626	Rattus norvegicus basement membrane-associated chondroitin proteoglycan Bamacan mRNA, complete cds.	7.60E-96	RNU82626_1	Rattus norvegicus basement membrane-associated chondroitin proteoglycan Bamacan mRNA, complete cds; Chondroitin sulfate proteoglycan; CSPG	8.20E-58

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
405	L09604	Homo sapiens differentiation-dependent A4 protein mRNA, complete cds.	2.00E-35	<NONE>	<NONE>	<NONE>
406	AB000516	Homo sapiens mRNA for DSIF p160, complete cds	0.41	POLG_TUMVQ	GENOME POLYPROTEIN (CONTAINS: N-TERMINAL PROTEIN; HELPER COMPONENT PROTEINASE (EC 3.4.22.-) (HC-PRO); 42-50 KD PROTEIN; CYTOPLASMIC INCLUSION PROTEIN (CI); 6 KD PROTEIN; VPG PROTEIN; NUCLEAR INCLUSION PROTEIN A (NI-A)	2.9
407	Z94753	Human DNA sequence from PAC 465G10 on chromosome X contains Menkes Disease (ATP7A) putative Cu ⁺⁺ -transporting P-type ATPase exons 22, 23 and STS	0.004	<NONE>	<NONE>	<NONE>
408	AB011123	Homo sapiens mRNA for KIAA0551 protein, partial cds	0	MI15_CAEEL	Q23356 caenorhabditis elegans. serine/threonine-protein kinase mig-15 (ec 2.7.1.-). 11/98	2.00E-51
409	D17218	Human HepG2 3' region MboI cDNA, clone hmd3g02m3	e-123	NARG_BACSU	NITRATE REDUCTASE ALPHA CHAIN (EC 1.7.99.4)	9.9
410	M95098	Bos taurus lysozyme gene (cow 2), complete cds	1.1	HAIR_MOUSE	HAIRLESS PROTEIN	8.00E-10

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
411	Z60048	H.sapiens CpG DNA, clone 187a9, reverse read cpg187a9.rt1a.	4.00E-54	HN3B_MOUSE	HEPATOCYTE NUCLEAR FACTOR 3-BETA (HNF-3B)	4.00E-21
412	Z48975	P.magnus gene for protein urPAB	0.014	YPT2_CAEEL	HYPOTHETICAL 21.6 KD PROTEIN F37A4.2 IN CHROMOSOME III	2.00E-12
413	AJ001296	Notophthalmus viridescens mRNA for cytokeratin 8	0.37	YA53_SCHPO	HYPOTHETICAL 24.2 KD PROTEIN C13A11.03 IN CHROMOSOME I	5.00E-21
414	J03831	Xenopus laevis (clone pXEC1.3) C protein mRNA, complete cds.	0.37	PDR5_YEAST	SUPPRESSOR OF TOXICITY OF SPORIDESMIN	3.3
415	AB007157	Homo sapiens gene for ribosomal protein S21, partial cds	e-142	RS21_HUMAN	40S RIBOSOMAL PROTEIN S21	0.002
416	X86340	H.sapiens C7 gene, exon 13	3.3	STC_DROME	SHUTTLE CRAFT PROTEIN	4.3
417	U12404	Human Csa-19 mRNA, complete cds.	0	R10A_PIG	60S RIBOSOMAL PROTEIN L10A (CSA-19) (FRAGMENT)	9.00E-57
418	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	8.00E-08	<NONE>	<NONE>	<NONE>
419	M80198	Human FKBP-12 pseudogene, clone lambda-512, 5' flank and complete cds.	5.00E-14	RCO1_NEUCR	TRANSCRIPTIONAL REPRESSOR RCO-1	0.008
420	AF052573	Homo sapiens DNA polymerase eta (POLH) mRNA, complete cds	0	<NONE>	<NONE>	<NONE>
421	AF035940	Homo sapiens MAGOH mRNA, complete cds	e-131	MGN_DROME	MAGO NASHI PROTEIN	4.00E-39
422	AF054994	Homo sapiens clone 23832 mRNA sequence	0.12	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
423	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	6.00E-05	<NONE>	<NONE>	<NONE>
424	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	7.00E-07	<NONE>	<NONE>	<NONE>
425	D43952	Mouse gene for reticulocalbin, exon1 and promoter region	0.36	<NONE>	<NONE>	<NONE>
426	X68553	C.elegans repetitive DNA sequence	0.4	TCB1_RABIT	T-CELL RECEPTOR BETA CHAIN PRECURSOR (ANA 11)	0.11
427	M83314	Tomato phenylalanine ammonia lyase (pal) gene, complete cds and promoter region.	3.3	SMB2_HUMAN	DNA-BINDING PROTEIN SMUBP-2 (GLIAL FACTOR-1) (GF-1)	0.65
428	AF070636	Homo sapiens clone 24686 mRNA sequence	5.00E-23	<NONE>	<NONE>	<NONE>
429	<NONE>	<NONE>	<NONE>	IQGA_HUMAN	RAS GTPASE-ACTIVATING-LIKE PROTEIN IQGAP1 (P195)	2.00E-06
430	AF068627	Mus musculus DNA cytosine-5 methyltransferase 3B2 (Dnmt3b) mRNA, alternatively spliced, complete cds	5.00E-04	LOX1_LENCU	LIPOXYGENASE (EC 1.13.11.12)	9.9
431	AF020043	Homo sapiens chromosome-associated polypeptide	0	YJH4_YEAST	HYPOTHETICAL 141.3 KD PROTEIN IN SCP160-MRPL8 INTERGENIC REGION	4.00E-16
432	K00046	ross river virus 26s subgenomic ma and junction region.	0.12	CUL2_HUMAN	CULLIN HOMOLOG 2 (CUL-2)	7.4

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
433	AF005664	Homo sapiens properdin (PFC) gene, complete cds	0.005	UL88_HCMVA	PROTEIN UL88	5.8
434	Z70705	H.sapiens mRNA (fetal brain cDNA com5)	2.00E-05	PH87_YEAST	INORGANIC PHOSPHATE TRANSPORTER PHO87	1.5
435	U29156	Mus musculus eps15R mRNA, complete cds.	e-125	EP15_HUMAN	EPIDERMAL GROWTH FACTOR RECEPTOR SUBSTRATE SUBSTRATE 15 (PROTEIN EPS15) (AF-1P PROTEIN)	1.00E-13
436	AE000750	Aquifex aeolicus section 82 of 109 of the complete genome	0.37	<NONE>	<NONE>	<NONE>
437	U49169	Dictyostelium discoideum V-ATPase A subunit (vatA) mRNA, complete cds	0.12	VCAP_HSV6U	MAJOR CAPSID PROTEIN (MCP)	5.6
438	AF032871	Homo sapiens uncoupling protein 3 (UCP3) gene, exon 1 and partial exon 2	0.13	WEE1_SCHPO	MITOSIS INHIBITOR PROTEIN KINASE WEE1 (EC 2.7.1.-)	3.7
439	AB000425	Porcine DNA for endopeptidase 24.16, exon 16 and complete cds	4.00E-32	<NONE>	<NONE>	<NONE>
440	U51037	Mus musculus 11-zinc-finger transcription factor	0.04	<NONE>	<NONE>	<NONE>
441	AF032456	Homo sapiens ubiquitin conjugating enzyme G2	e-110	<NONE>	<NONE>	<NONE>
442	AF009288	Homo sapiens clone HEB8 Cri-du-chat region mRNA	2.00E-14	LMG1_HUMAN	LAMININ GAMMA-1 CHAIN PRECURSOR (LAMININ B2 CHAIN)	8.1

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
443	AF024578	Homo sapiens type-1 protein phosphatase skeletal muscle glycogen targeting subunit (PPP1R3) gene, exon 4, and complete cds	1.1	<NONE>	<NONE>	<NONE>
444	M24486	Human prolyl 4-hydroxylase alpha subunit mRNA, complete cds, clone PA-11.	0	DACHA	<NONE>	4.00E-58
445	X96400	P.tetraulera alpha-51D gene	0.37	<NONE>	<NONE>	<NONE>
446	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>
447	X84996	X.laevis mRNA for selenocysteine tRNA acting factor (Staf)	0.12	POL_MLVRD	POL POLYPROTEIN (PROTEASE (EC 3.4.23.-); REVERSE TRANSCRIPTASE (EC 2.7.7.49); RIBONUCLEASE H (EC 3.1.26.4))	2.00E-08
448	AF019980	Dictyostelium discoideum ZipA (zipA) gene, partial cds	3.4	HMDL_BRAFL	HOMEBOX PROTEIN DLL HOMOLOG	0.23
449	X78424	D.carota (Queen Anne's Lace) Inv*Dc2 gene, 3432bp	0.38	<NONE>	<NONE>	<NONE>
450	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>
451	X89886	P.patens mRNA for 5-aminolevulinate dehydratase	1.1	CKR6_HUMAN	C-C CHEMOKINE RECEPTOR TYPE 6 (C-C CKR-6) (CCR6)	9.9
452	U67471	Methanococcus jannaschii section 13 of 150 of the complete genome	0.12	YR72_ECOLI	HYPOTHETICAL 53.2 KD PROTEIN (ORF2) (RETRON EC67)	5.8
453	AF060246	Mus musculus strain C57BL/6 zinc finger protein 106 (Zfp106) mRNA, H3a-a allele, complete cds	1.00E-62	YOJ8_CAEEL	HYPOTHETICAL 51.6 KD PROTEIN ZK353.8 IN CHROMOSOME III	1.7

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
454	U70667	Human Fas-ligand associated factor 1 mRNA, partial cds	0	YKB2_YEAST	HYPOTHETICAL 69.1 KD PROTEIN IN PUT3-CCE1 INTERGENIC REGION	3.00E-09
455	M95858	Bos taurus recoverin mRNA, complete cds.	0.35	GIDA_MYCGE	GLUCOSE INHIBITED DIVISION PROTEIN A	1.4
456	U67594	Methanococcus jannaschii section 136 of 150 of the complete genome	0.36	<NONE>	<NONE>	<NONE>
457	X06747	Human hnRNP core protein A1	3.00E-31	<NONE>	<NONE>	<NONE>
458	Z65575	H.sapiens CpG DNA, clone 47c5, reverse read cpg47c5.r11a .	1.3	<NONE>	<NONE>	<NONE>
459	X88893	C.jacchus intron 4 of visual pigment gene	5.00E-15	<NONE>	<NONE>	<NONE>
460	M57426	Maize stripe virus RNA 3 nonstructural protein	0.33	DSC2_MOUSE	DESMOCOLLIN 2A/2B PRECURSOR (EPITHELIAL TYPE 2 DESMOCOLLIN)	6.5
461	X01638	Yeast TEF1 gene for elongation factor EF-1 alpha	1.1	PPOL_DROME	POLY (ADP-RIBOSE) POLYMERASE (EC 2.4.2.30) (PARP)	3.5
462	M60064	S.typhimurium glutamate 1-semialdehyde aminotransferase (hemL) gene, complete cds.	1.1	EPB4_MOUSE	EPHRIN TYPE-B RECEPTOR 4 PRECURSOR (EC 2.7.1.112) KINASE 2) (TYROSINE KINASE MYK- 1)	2.5
463	X51508	Rabbit mRNA for aminopeptidase N (partial)	0.36	ACHG_XENLA	ACETYLCHOLINE RECEPTOR PROTEIN, GAMMA CHAIN PRECURSOR	1.5
464	L10106	Mus musculus protein tyrosine phosphate mRNA, complete cds.	2.00E-58	VG13_BPML5	GENE 13 PROTEIN (GP13)	2.5

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
465	M77235	Human cardiac tetrodotoxin-insensitive voltage-dependent sodium channel alpha subunit (HH1) mRNA, complete cds.	3.8	ZPBOC1	<NONE>	6.9
466	M58330	C.maltosa autonomously replicating sequence.	0.004	EPB4_MOUSE	EPHRIN TYPE-B RECEPTOR 4 PRECURSOR (EC 2.7.1.112) KINASE 2) (TYROSINE KINASE MYK- 1)	2.4
467	X51508	Rabbit mRNA for aminopeptidase N (partial)	0.35	ACHG_XENLA	ACETYLCHOLINE RECEPTOR PROTEIN, GAMMA CHAIN PRECURSOR	2.4
468	L10106	Mus musculus protein tyrosine phosphate mRNA, complete cds.	7.00E-59	VGLI_PRVRI	GLYCOPROTEIN GP63 PRECURSOR	4.3
469	U65939	Azotobacter vinelandii GTPase (ftsA) gene, partial cds, and ATP binding protein (ftsZ) gene, complete cds	1.1	TRUA_BACSP	Q45557 bacillus sp. (strain ksm-64). trna pseudouridine synthase a (ec 4.2.1.70) (pseudouridylate synthase i) (pseudouridine synthase i) (uracil hydrolyase). 11/98	0.001
470	U51037	Mus musculus 11-zinc-finger transcription factor	0.041	<NONE>	<NONE>	<NONE>
471	M32685	Human platelet glycoprotein IIIa, exon 14.	3.6	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
472	U82691	Phrynocephalus raddei CAS 179770 NADH dehydrogenase subunit 1 (ND1), partial cds, tRNA-Gln, tRNA-Ile and tRNA-Met, NADH dehydrogenase subunit 2 tRNA-Cys and tRNA-Tyr and c...	1.1	<NONE>	<NONE>	<NONE>
473	D85430	Mouse Murr1 mRNA, exon	0.12	EPA5_CHICK	EPHRIN TYPE-A RECEPTOR 5 PRECURSOR (EC 2.7.1.112)	2.5
474	U20661	Dictyostelium discoideum unknown internal repeat protein gene, complete cds, and unknown orf1, orf2 and orf3 genes, partial cds	0.36	YHL1_EBV	HYPOTHETICAL BHLF1 PROTEIN	4.00E-04
475	X56537	Human novel homeobox mRNA for a DNA binding protein	0.04	FA5_HUMAN	COAGULATION FACTOR V PRECURSOR (ACTIVATED PROTEIN C COFACTOR)	9.5
476	U32843	Haemophilus influenzae Rd section 158 of 163 of the complete genome	5	<NONE>	<NONE>	<NONE>
477	U67554	Methanococcus jannaschii section 96 of 150 of the complete genome	0.36	<NONE>	<NONE>	<NONE>
478	AB004244	Narke japonica mRNA for Nj-synaphin 1b, complete cds	1.1	NIA1_ORYSA	NITRATE REDUCTASE 1 (EC 1.6.6.1) (NR1)	1.00E-07
479	AF075079	Homo sapiens full length insert cDNA YQ80A08	1.00E-12	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
480	AE000723	Aquifex aeolicus section 55 of 109 of the complete genome	1	YKK0_YEAST	HYPOTHETICAL 67.5 KD PROTEIN IN APE1/LAP4-CWP1 INTERGENIC REGION	9.1
481	X73902	H.sapiens mRNA for nicein B2 chain	0	LMG2_HUMAN	LAMININ GAMMA-2 CHAIN PRECURSOR	3.00E-93
482	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	3.00E-10	P53_CRIGR	CELLULAR TUMOR ANTIGEN P53	5.7
483	AL010240	Plasmodium falciparum DNA *** SEQUENCING IN PROGRESS *** from contig 4-64, complete sequence	1.2	<NONE>	<NONE>	<NONE>
484	U49919	Arabidopsis thaliana lupeol synthase mRNA, complete cds	0.54	YA53_SCHPO	HYPOTHETICAL 24.2 KD PROTEIN C13A11.03 IN CHROMOSOME I	6.00E-10
485	AF077618	Homo sapiens p73 gene, exon 3	0.39	MYOD_MOUSE	MYOBLAST DETERMINATION PROTEIN 1	2.1
486	AF054994	Homo sapiens clone 23832 mRNA sequence	0.13	<NONE>	<NONE>	<NONE>
487	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-10	<NONE>	<NONE>	<NONE>
488	AF068627	Mus musculus DNA cytosine-5 methyltransferase 3B2 (Dnmt3b) mRNA, alternatively spliced, complete cds	5.00E-04	ACE2_YEAST	METALLOTHIONE IN EXPRESSION ACTIVATOR	1.5
489	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-07	RINI_PIG	RIBONUCLEASE INHIBITOR	0.19

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
490	L77886	Human protein tyrosine phosphatase mRNA, complete cds	1.00E-21	VS48_TBRVS	SATELLITE RNA 48 KD PROTEIN	1.6
491	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	5.00E-04	CRP3_LIMPO	C-REACTIVE PROTEIN 3.3 PRECURSOR	3.5
492	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	8.00E-08	EPA5_CHICK	EPHRIN TYPE-A RECEPTOR 5 PRECURSOR (EC 2.7.1.112)	2.7
493	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	3.00E-09	<NONE>	<NONE>	<NONE>
494	U28153	Caenorhabditis elegans UNC-76 (unc-76) gene, complete cds.	0.37	<NONE>	<NONE>	<NONE>
495	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	0.37	NCPR_YEAST	NADPH-CYTOCHROME P450 REDUCTASE (EC 1.6.2.4) (CPR)	7.00E-05
496	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	0.013	YMB3_CAEEL	PROBABLE INTEGRIN ALPHA CHAIN F54G8.3 PRECURSOR	3.3
497	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	7.00E-07	<NONE>	<NONE>	<NONE>
498	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	1.00E-10	<NONE>	<NONE>	<NONE>
499	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	2.00E-07	VGLY_LYCVW	GLYCOPROTEIN POLYPROTEIN PRECURSOR (CONTAINS: GLYCOPROTEINS G1 AND G2)	3.2

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
500	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	8.00E-06	HR78_DROME	NUCLEAR HORMONE RECEPTOR HR78 (DHR78) (NUCLEAR RECEPTOR XR78E/F)	2.5
501	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	9.00E-10	MYSH_BOVIN	MYOSIN I HEAVY CHAIN-LIKE PROTEIN (MIHC) (BRUSH BORDER MYOSIN I) (BBMI)	4.00E-04
502	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	2.00E-04	BAL_HUMAN	BILE-SALT-ACTIVATED LIPASE PRECURSOR (EC 3.1.1.3) (EC 3.1.1.13) (BAL) (BILE-SALT-STIMULATED LIPASE) (BSSL) (ESTERASE) (PANCREATIC LYSOPHOSPHOLIPASE)	2.6
503	AF080399	Drosophila melanogaster mitotic checkpoint control protein kinase BUB1 (Bub1) mRNA, complete cds	1.1	NAT1_YEAST	N-TERMINAL ACETYLTRANSFERASE 1 (EC 2.3.1.88)	2.00E-23
504	U59706	Gallus gallus alternatively spliced AMPA glutamate receptor, isoform GluR2 flop, (GluR2) mRNA, partial cds.	0.014	<NONE>	<NONE>	<NONE>
505	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	2.00E-05	<NONE>	<NONE>	<NONE>
506	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	2.00E-04	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
507	AF100661	Caenorhabditis elegans cosmid H20E11	0.38	<NONE>	<NONE>	<NONE>
508	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-11	CA1A_HUMAN	COLLAGEN ALPHA 1(X) CHAIN PRECURSOR	0.024
509	U47322	Cloning vector DNA, complete sequence.	2.00E-38	COA1_SV40	COAT PROTEIN VP1	6.2
510	AF031924	Homo sapiens homeobox transcription factor barx2	e-156	CCMA_HAEIN	HEME EXPORTER PROTEIN A (CYTOCHROME C-TYPE BIOGENESIS ATP-BINDING PROTEIN CCMA)	3.5
511	AF010484	Homo sapiens ICI YAC 91A12, right end sequence	3.00E-10	<NONE>	<NONE>	<NONE>
512	Z63829	H.sapiens CpG DNA, clone 90h2, forward read cpg90h2.ft1a .	5.00E-22	NFIR_MESAU	NUCLEAR FACTOR 1 CLONE PNF1/RED1 (NF-1) (CCAAT-BOX BINDING TRANSCRIPTION FACTOR) (CTF) (TGGCA-BINDING PROTEIN)	2.4
513	Z35094	H.sapiens mRNA for SURF-2	5.00E-97	SUR2_HUMAN	SURFEIT LOCUS PROTEIN 2	1.00E-46
514	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	7.00E-06	<NONE>	<NONE>	<NONE>
515	D38417	Mouse mRNA for arylhydrocarbon receptor, complete cds	e-154	TEGU_EBV	LARGE TEGUMENT PROTEIN	3.4
516	L10911	Homo sapiens splicing factor (CC1.4) mRNA, complete cds.	e-117	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
517	X17093	Human HLA-F gene for human leukocyte antigen F	0.009	YEN1_SCHPO	O13695 schizosaccharomyces pombe (fission yeast). hypothetical 52.9 kd serine-rich protein c11g7.01 in chromosome i. 11/98	5.4
518	AB017026	Mus musculus mRNA for oxysterol-binding protein, complete cds	0	OXYB_HUMAN	OXYSTEROL-BINDING PROTEIN	1.00E-40
519	X55038	Mouse mCENP-B gene for centromere autoantigen B	0.001	YNW7_YEAST	HYPOTHETICAL 68.8 KD PROTEIN IN URE2-SSU72 INTERGENIC REGION	3.00E-04
520	AB018323	Homo sapiens mRNA for KIAA0780 protein, partial cds	3.00E-41	LBR_CHICK	LAMIN B RECEPTOR	2.3
521	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	1.00E-10	CA25_HUMAN	PROCOLLAGEN ALPHA 2(V) CHAIN PRECURSOR	0.002
522	X03558	Human mRNA for elongation factor 1 alpha subunit	0	EF11_HUMAN	ELONGATION FACTOR 1-ALPHA 1 (EF-1-ALPHA-1)	e-110
523	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-11	YMT8_YEAST	HYPOTHETICAL 36.4 KD PROTEIN IN NUP116-FAR3 INTERGENIC REGION	8.00E-07
524	AB014591	Homo sapiens mRNA for KIAA0691 protein, complete cds	0	NOT2_YEAST	GENERAL NEGATIVE REGULATOR OF TRANSCRIPTION SUBUNIT 2	8.00E-05
525	AB019488	Homo sapiens DNA for TRKA, exon 17 and complete cds	0	TRKA_HUMAN	HIGH AFFINITY NERVE GROWTH FACTOR RECEPTOR PRECURSOR PROTEIN(P140-TRKA)	2.00E-27

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
526	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	5.00E-15	CNG4_BOVIN	240K PROTEIN OF ROD PHOTORECEPTOR CNG-CHANNEL CYCLIC-NUCLEOTIDE-GATED CATION CHANNEL 4 (CNG CHANNEL 4) MODULATORY SUBUNIT))	0.018
527	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	2.00E-06	HMZ1_DROME	ZERKNUELLT PROTEIN 1 (ZEN-1)	0.88
528	J03750	Mouse single stranded DNA binding protein p9 mRNA, complete cds.	e-135	P15_HUMAN	ACTIVATED RNA POLYMERASE II TRANSCRIPTIONAL COACTIVATOR P15 (PC4) (P14)	3.00E-21
529	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	1.00E-12	RS5_DROME	40S RIBOSOMAL PROTEIN S5	0.42
530	Z57610	H.sapiens CpG DNA, clone 187a10, reverse read cpg187a10.rt1a.	8.00E-61	HN3B_MOUSE	HEPATOCYTE NUCLEAR FACTOR 3-BETA (HNF-3B)	4.00E-15
531	U95760	Drosophila melanogaster strawberry notch (sno) mRNA, complete cds	3.00E-60	<NONE>	<NONE>	<NONE>
532	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	4.00E-11	<NONE>	<NONE>	<NONE>
533	U50535	Human BRCA2 region, mRNA sequence CG006	4.00E-12	ALU1_HUMAN	!!!! ALU SUBFAMILY J WARNING ENTRY !!!!	1.1
534	X92841	H.sapiens MICA gene	1.00E-55	LIN1_HUMAN	LINE-1 REVERSE TRANSCRIPTASE HOMOLOG	6.00E-09

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
535	U60337	Homo sapiens beta-mannosidase mRNA, complete cds	0	NODC_BRAEL	N-ACETYLGLUCOSAMINYLTRANSFERASE (EC 2.4.1.-)	1.4
536	M21731	Human lipocortin-V mRNA, complete cds.	e-169	ANX5_HUMAN	ANNEXIN V (LIPOCORTIN V) (ENDONEXIN II) (CALPHOBINDIN I) (CBP-I) (PLACENTAL ANTICOAGULANT PROTEIN I) (PAP-I) ANTICOAGULANT -ALPHA) (VAC-ALPHA) (ANCHORIN CII)	1.00E-05
537	Y08013	S.salar DNA segment containing GT repeat	0.006	<NONE>	<NONE>	<NONE>
538	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>
539	M98502	Mus musculus protein encoding twelve zinc finger proteins (pMLZ-4) mRNA, complete cds.	2.00E-17	DYNA_CHICK	DYNACTIN, 117 KD ISOFORM	7.4
540	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	6.00E-05	HXA3_HAEIN	HEME:HEMOPEXIN-BINDING PROTEIN PRECURSOR	2.6
541	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	1.00E-13	AMO_KLEAE	AMINE OXIDASE PRECURSOR (EC 1.4.3.6) (MONAMINE OXIDASE) (TYRAMINE OXIDASE)	1.5
542	AF083322	Homo sapiens centriole associated protein CEP110 mRNA, complete cds	e-133	CA34_HUMAN	PROCOLLAGEN ALPHA 3(IV) CHAIN PRECURSOR	1.5
543	J03746	Human glutathione S-transferase mRNA, complete cds.	e-170	GTMI_HUMAN	GLUTATHIONE S-TRANSFERASE, MICROSOMAL (EC 2.5.1.18)	5.00E-39

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
544	U67522	Methanococcus jannaschii section 64 of 150 of the complete genome	0.37	A1AA_HUMAN	ALPHA-1A ADRENERGIC RECEPTOR	4.3
545	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	2.00E-07	<NONE>	<NONE>	<NONE>
546	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>
547	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>
548	D87001	Human (lambda) DNA for immunoglobulin light chain	0.35	VAL3_TYLCU	AL3 PROTEIN (C3 PROTEIN)	3.2
549	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	3.00E-08	TEGU_HSV11	LARGE TEGUMENT PROTEIN (VIRION PROTEIN UL36)	0.004
550	D16991	Human HepG2 partial cDNA, clone hmd2d01m5	8.00E-09	PTM1_YEAST	PROTEIN PTM1 PRECURSOR	0.033
551	M34025	Human fetal Ig heavy chain variable region	3.2	<NONE>	<NONE>	<NONE>
552	M98502	Mus musculus protein encoding twelve zinc finger proteins (pMLZ-4) mRNA, complete cds.	5.00E-14	<NONE>	<NONE>	<NONE>
553	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	0.002	<NONE>	<NONE>	<NONE>
554	Z78730	H.sapiens flow-sorted chromosome 6 HindIII fragment, SC6pA15C3	3.00E-20	ALU1_HUMAN	!!!! ALU SUBFAMILY J WARNING ENTRY !!!!	5.00E-06
555	U74496	Human chromosome 4q35 subtelomeric sequence	8.00E-08	ICP4_VZVD	TRANS-ACTING TRANSCRIPTIONAL PROTEIN ICP4	0.39

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
556	U39875	Rattus norvegicus EF-hand Ca ²⁺ -binding protein p22 mRNA, complete cds.	2.00E-56	YHFK_ECOLI	HYPOTHETICAL 79.5 KD PROTEIN IN CRP-ARGD INTERGENIC REGION (O696)	9.8
557	U65416	Human MHC class I molecule (MICB) gene, complete cds	0.12	<NONE>	<NONE>	<NONE>
558	AG000037	Homo sapiens genomic DNA, 21q region, clone: 9H11A22	5.00E-25	<NONE>	<NONE>	<NONE>
559	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	5.00E-05	<NONE>	<NONE>	<NONE>
560	AB007918	Homo sapiens mRNA for KIAA0449 protein, partial cds	0.015	VGLE_HSV11	GLYCOPROTEIN PRECURSOR	2.2
561	U58884	Mus musculus SH3-containing protein SH3P7 mRNA, complete cds. similar to Human Drebrin	1.00E-73	YCV2_YEAST	HYPOTHETICAL 13.8 KD PROTEIN IN PWP2-SUP61 INTERGENIC REGION	2.6
562	AB007878	Homo sapiens KIAA0418 mRNA, complete cds	e-110	GLU2_MAIZE	GLUTELIN 2 PRECURSOR (ZEIN-GAMMA) (27 KD ZEIN)	0.72
563	AF065482	Homo sapiens sorting nexin 2 (SNX2) mRNA, complete cds	0	YJD6_YEAST	HYPOTHETICAL 49.0 KD PROTEIN IN NSP1-KAR2 INTERGENIC REGION	1.4
564	U27873	Stealth virus 1 clone 3B11 T7	0.002	SYN1_HUMAN	SYNAPSINS IA AND IB (BRAIN PROTEIN 4.1)	1.6
565	L38951	Homo sapiens importin beta subunit mRNA, complete cds	2.00E-68	VP2_BRD	STRUCTURAL CORE PROTEIN VP2	1.1
566	AF007155	Homo sapiens clone 23763 unknown mRNA, partial cds	e-165	YOHI_AZOVI	HYPOTHETICAL 33.2 KD PROTEIN IN IBPB 5'REGION	7.5

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
567	Z56295	H.sapiens CpG DNA, clone 10c2, forward read cpg10c2.ft1a .	0.12	A1AB_CANFA	ALPHA-1B ADRENERGIC RECEPTOR (FRAGMENT)	0.85
568	Z83792	G.gallus microsatellite DNA (LEI0222	0.12	<NONE>	<NONE>	<NONE>
569	U11820	Feline immunodeficiency virus USIL2489_7B gag polyprotein (gag) gene, complete cds, polymerase polyprotein (pol) gene, partial cds, vif protein (vif), complete cds, and envelope glycoprotein (env), complete cds, complete g...	1.1	<NONE>	<NONE>	<NONE>
570	M18065	Mouse 18S and 28S ribosomal DNA, 5' hypervariable (Vr) region, clone M1.	6.00E-04	CC40_YEAST	CELL DIVISION CONTROL PROTEIN 40	3.7
571	AF053645	Homo sapiens cellular apoptosis susceptibility protein (CSE1) gene, exons 3 through 10	2.00E-07	YMQ4_CAEEL	HYPOTHETICAL 25.8 KD PROTEIN K02D10.4 IN CHROMOSOME III	4.3
572	X04588	Human 2.5 kb mRNA for cytoskeletal tropomyosin TM30(nm)	0	<NONE>	<NONE>	<NONE>
573	AC001159	Homo sapiens (subclone 1_h9 from PAC H92) DNA sequence	5.00E-04	XYND_CELFI	ENDO-1,4-BETA-XYLANASE D PRECURSOR (EC 3.2.1.8)	7.3
574	Z60625	H.sapiens CpG DNA, clone 2c10, forward read cpg2c10.ft1aa .	4.00E-13	<NONE>	<NONE>	<NONE>
575	AF070640	Homo sapiens clone 24781	e-164	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		mRNA sequence				
576	Y11306	Homo sapiens mRNA for hTCF-4	2.00E-48	TCF1_HUMAN	T-CELL-SPECIFIC TRANSCRIPTION FACTOR 1 (TCF-1)	2.00E-15
577	X65279	pWE15 cosmid vector DNA	7.00E-69	OCLN_POTTR	Q28793 potorous tridactylus (potoroo). occludin. 11/98	0.71
578	M10296	Mouse DNA with homology to EBV IR3 repeat, segment 1, clone Mu2.	0.001	LMB1_HYDAT	LAMININ BETA-1 CHAIN PRECURSOR (FRAGMENTS)	1.9
579	X53744	Canine mRNA for 68kDA subunit of signal recognition particle (SRP68)	e-162	SR68_CANFA	SIGNAL RECOGNITION PARTICLE 68 KD PROTEIN (SRP68)	5.00E-16
580	AF086438	Homo sapiens full length insert cDNA clone ZD80G11	2.00E-04	<NONE>	<NONE>	<NONE>
581	U15140	Mycobacterium bovis ribosomal proteins IF-1 complete cds, and S4 (rpsD) gene, partial cds	1.3	<NONE>	<NONE>	<NONE>
582	D13292	Human mRNA for ryudocan core protein	e-166	RSP4_ARATH	40S RIBOSOMAL PROTEIN SA (P40) (LAMININ RECEPTOR HOMOLOG)	1.4
583	S71022	neoplasm-related C140 product [human, thyroid carcinoma cells, mRNA, 670 nt]	9.00E-30	RL6_HUMAN	60S RIBOSOMAL PROTEIN L6 (TAX-RESPONSIVE ENHANCER ELEMENT BINDING PROTEIN 107) (TAXREB107)	5.6
584	L20934	Anopheles gambiae complete mitochondrial genome	0.014	<NONE>	<NONE>	<NONE>
585	Z49269	H.sapiens gene for chemokine HCC-1.	1.1	AMY1_DICTH	ALPHA-AMYLASE 1 (EC 3.2.1.1) (1,4-ALPHA-D-GLUCAN GLUCANOHYDROLASE)	2.5

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
586	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	2.00E-04	<NONE>	<NONE>	<NONE>
587	AF029893	Homo sapiens i-beta-1,3-N-acetylglucosaminyltransferase mRNA, complete cds	0.13	HEMO_PIG	HEMOPEXIN PRECURSOR (HYALURONIDASE) (EC 3.2.1.35)	3.5
588	J05109	T.thermophila calcium-binding 25 kDa (TCBP 25) protein gene, complete cds.	0.014	<NONE>	<NONE>	<NONE>
589	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	6.00E-04	<NONE>	<NONE>	<NONE>
590	AF060246	Mus musculus strain C57BL/6 zinc finger protein 106 (Zfp106) mRNA, H3a-a allele, complete cds	1.00E-83	SCRB_PEDPE	SUCROSE-6-PHOSPHATE HYDROLASE (EC 3.2.1.26) (SUCRASE)	10
591	Y11966	B.aphidicola (host T.suberi) plasmid pBTs1 genes leuA, hspA, repA2, repA1, leuB, leuC, leuD, leuA	0.37	<NONE>	<NONE>	<NONE>
592	U20428	Human SNC19 mRNA sequence	1.00E-64	YY22_MYCTU	HYPOTHETICAL 30.8 KD PROTEIN CY49.22	0.29
593	AF043084	Lycopersicon esculentum ethylene receptor homolog (ETR1) mRNA, complete cds	0.37	KNIR_DROME	ZYGOTIC GAP PROTEIN KNIRPS	9.9
594	X65279	pWE15 cosmid vector DNA	5.00E-66	COA1_SV40	COAT PROTEIN VP1	0.001
595	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial	0.041	UL88_HSV7J	PROTEIN U59	5.8

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		cds				
596	M91452	Sus scrofa ryanodine receptor (RYP1) gene, complete cds.	3.2	<NONE>	<NONE>	<NONE>
597	U77327	Human Ki-1/57 intracellular antigen mRNA, partial cds	e-158	GAT1_CHICK	ERYTHROID TRANSCRIPTION FACTOR (GATA-1) (ERYF1)	1.2
598	U77327	Human Ki-1/57 intracellular antigen mRNA, partial cds	0	RPB7_ARATH	DNA-DIRECTED RNA POLYMERASE II 19 KD POLYPEPTIDE (EC 2.7.7.6) (RNA POLYMERASE II SUBUNIT 5)	6.2
599	Y16964	Saccharomyces sp. mitochondrial DNA for OLI1 gene, strain CID1	0.37	NMD5_YEAST	NONSENSE-MEDIATED MRNA DECA Y PROTEIN 5	1.9
600	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	6.00E-06	<NONE>	<NONE>	<NONE>
601	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	8.00E-08	<NONE>	<NONE>	<NONE>
602	AF091046	Brugia pahangi nuclear hormone receptor (bhr-1) gene, partial cds	1.1	INVO_PONPY	INVOLUCRIN	0.23
603	M87339	Human replication factor C, 37-kDa subunit mRNA, complete cds	0	AC12_HUMAN	ACTIVATOR 1 37 KD SUBUNIT (REPLICATION FACTOR C 37 KD SUBUNIT) (A1 37 KD SUBUNIT) (RF-C 37 KD SUBUNIT) (RFC37)	1.00E-38
604	D28116	Human genes for collagen type IV alpha 5 and 6, exon 1 and exon	0.39	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		1'				
605	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	2.00E-06	<NONE>	<NONE>	<NONE>
606	AE001149	Borrelia burgdorferi (section 35 of 70) of the complete genome	0.13	<NONE>	<NONE>	<NONE>
607	X14168	Human pLC46 with DNA replication origin	6.00E-16	Z136_HUMAN	ZINC FINGER PROTEIN 136	0.31
608	Z57610	H.sapiens CpG DNA, clone 187a10, reverse read cpg187a10.r1a.	7.00E-90	HN3B_RAT	HEPATOCYTE NUCLEAR FACTOR 3-BETA (HNF-3B)	1.00E-19
609	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	0.043	PGCV_MOUSE	VERSICAN CORE PROTEIN PRECURSOR (LARGE FIBROBLAST PROTEOGLYCAN) (CHONDROITIN SULFATE PROTEOGLYCAN CORE PROTEIN 2) (PG-M)	3.5
610	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	7.00E-07	CA11_CHICK	PROCOLLAGEN ALPHA 1(I) CHAIN PRECURSOR	0.4
611	AB007956	Homo sapiens mRNA, chromosome 1 specific transcript KIAA0487	e-106	RRPB_CVMA5	RNA-DIRECTED RNA POLYMERASE (EC 2.7.7.48) (ORF1B)	9.7
612	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	0.005	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
613	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	6.00E-05	UL52_EBV	HELICASE/PRIMASE COMPLEX PROTEIN (PROBABLE DNA REPLICATION PROTEIN BSLF1)	5.9
614	U95760	Drosophila melanogaster strawberry notch (sno) mRNA, complete cds	3.00E-71	POLG_PVYHU	GENOME POLYPROTEIN (CONTAINS: N-TERMINAL PROTEIN; HELPER COMPONENT PROTEINASE (EC 3.4.22.-) (HC-PRO); 42-50 KD PROTEIN; CYTOPLASMIC INCLUSION PROTEIN (CI); 6 KD PROTEIN; NUCLEAR INCLUSION PROTEIN A (NI- A) (EC 3.4.22.-) (49K PROTEINASE) (49	4.3
615	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	9.00E-09	VP3_ROTPO	INNER CORE PROTEIN VP3	7.7
616	J05499	Rattus norvegicus L-glutamine amidohydrolase mRNA, complete cds	e-143	GLSL_RAT	GLUTAMINASE, LIVER ISOFORM PRECURSOR (EC 3.5.1.2) (GLS)	7.00E-67
617	M19262	Rat clathrin light chain (LCB3) mRNA, complete cds.	0.37	Y642_METJA	HYPOTHETICAL PROTEIN MJ0642	5.8
618	M21191	Human aldolase pseudogene mRNA, complete cds.	1.00E-32	LIN1_NYCCO	LINE-1 REVERSE TRANSCRIPTASE HOMOLOG	6.00E-17
619	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	1.00E-11	NUCM_BOVIN	NADH-UBIQUINONE OXIDOREDUCTASE 49 KD SUBUNIT (EC 1.6.5.3) (EC 1.6.99.3) (COMPLEX I-49KD) (CI-49KD)	0.044

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Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
620	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	0.005	HEMZ_RHOCA	FERROCHELATASE (EC 4.99.1.1) (PROTOHEME FERRO-LYASE)	4.4
621	AF041428	Homo sapiens ribosomal protein s4 X isoform gene, complete cds	0.002	<NONE>	<NONE>	<NONE>
622	X07158	Chironomus thummi DNA for Cla repetitive element	0.13	<NONE>	<NONE>	<NONE>
623	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	8.00E-04	<NONE>	<NONE>	<NONE>
624	AF100470	Rattus norvegicus ribosome attached membrane protein 4 (RAMP4) mRNA, complete cds	1.00E-53	<NONE>	<NONE>	<NONE>
625	U85193	Human nuclear factor I-B2 (NFIB2) mRNA, complete cds	2.00E-38	<NONE>	<NONE>	<NONE>
626	M13452	Human lamin A mRNA, 3'end.	6.00E-16	<NONE>	<NONE>	<NONE>
627	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	0.014	ACDV_RAT	ACYL-COA DEHYDROGENASE, VERY-LONG-CHAIN SPECIFIC PRECURSOR (EC 1.3.99.-) (VLCAD)	4.00E-20
628	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	3.00E-10	<NONE>	<NONE>	<NONE>
629	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>
630	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	2.00E-05	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
631	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	6.00E-05	<NONE>	<NONE>	<NONE>
632	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	6.00E-05	YS83_CAEEL	HYPOTHETICAL 86.9 KD PROTEIN ZK945.3 IN CHROMOSOME II	0.65
633	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-09	NRP_MOUSE	NEUROPILIN PRECURSOR (A5 PROTEIN)	2.7
634	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	2.00E-05	Y4JN_RHISN	HYPOTHETICAL 16.3 KD PROTEIN Y4JN	5.9
635	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	6.00E-05	<NONE>	<NONE>	<NONE>
636	X64707	H.sapiens BBC1 mRNA	e-179	RL13_HUMAN	60S RIBOSOMAL PROTEIN L13 (BREAST BASIC CONSERVED PROTEIN 1)	5.00E-40
637	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-08	<NONE>	<NONE>	<NONE>
638	X14168	Human pLC46 with DNA replication origin	5.00E-14	SP3_HUMAN	TRANSCRIPTION FACTOR SP3 (SPR-2) (FRAGMENT)	0.19
639	X90999	H.sapiens mRNA for Glyoxalase II	9.00E-20	GLO2_HUMAN	HYDROXYACYLG LUTATHIONE HYDROLASE (EC 3.1.2.6)	0.007
640	AF083322	Homo sapiens centriole associated protein CEP110 mRNA, complete cds	9.00E-51	KIF4_MOUSE	KINESIN-LIKE PROTEIN KIF4	0.005

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
641	Z12002	M.musculus Pvt-1 mRNA.	0.36	CP5F_CANTR	CYTOCHROME P450 LIIA6 (ALKANE-INDUCIBLE) (EC 1.14.14.1) (P450-ALK3)	5.6
642	M10206	R.sphaeroides reaction center L subunit (complete cds) and M subunit (5' end) genes.	1.1	YGR1_YEAST	HYPOTHETICAL 34.8 KD PROTEIN IN SUT1-RCK1 INTERGENIC REGION	0.006
643	K02668	E. coli ddl gene encoding D-alanine:D-alanine ligase and ftsQ and ftsA genes, complete cds, and ftsZ gene, 5' end.	3.3	ANKB_HUMAN	ANKYRIN, BRAIN VARIANT 1 (ANKYRIN B) (ANKYRIN, NONERYTHROID)	7.00E-07
644	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>	<NONE>
645	X53616	C.domesticus calnexin (pp90) mRNA	1.1	<NONE>	<NONE>	<NONE>
646	X57010	Human COL2A1 gene for collagen II alpha 1 chain, exons E2-E15	3.3	PRIO_PIG	MAJOR PRION PROTEIN PRECURSOR (PRP)	1.9
647	U95097	Xenopus laevis mitotic phosphoprotein 43 mRNA, partial cds	1.1	UL07_HSV2H	PROTEIN UL7	7.3
648	X52956	Human CAMI1-psi3 calmodulin retropseudogene	0.37	PRTP_EBV	PROBABLE PROCESSING AND TRANSPORT PROTEIN	7.5
649	M93425	Human protein tyrosine phosphatase (PTP-PEST) mRNA, complete cds.	0	PTNC_HUMAN	PROTEIN-TYROSINE PHOSPHATASE G1 (EC 3.1.3.48) (PTPG1)	e-107
650	L47615	Mus musculus DNA-binding protein (Fli-1) gene, 5' end of cds.	0.13	YA53_SCHPO	HYPOTHETICAL 24.2 KD PROTEIN C13A11.03 IN CHROMOSOME I	2.00E-07
651	U60337	Homo sapiens beta-mannosidase mRNA, complete	0	GIL1_ENTHI	GALACTOSE-INHIBITABLE LECTIN 170 KD	0.22

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		cds			SUBUNIT	
652	U08813	Oryctolagus cuniculus Na+/glucose cotransporter-related protein mRNA, complete cds.	1.00E-22	NAG1_HUMAN	SODIUM/GLUCOSE COTRANSPORTER 1 (NA(+)/GLUCOSE COTRANSPORTER 1) (HIGH AFFINITY SODIUM-GLUCOSE COTRANSPORTER)	0.1
653	Y00282	Human mRNA for ribophorin II	2.00E-78	RIB2_HUMAN	DOLICHYL-DIPHOSPHOOLIGOSACCHARIDE--PROTEIN GLYCOSYLTRANSFERASE 63 KD SUBUNIT PRECURSOR (EC 2.4.1.119) (RIBOPHORIN II)	5.00E-19
654	D10051	Human gene for 92-kDa type IV collagenase, 5'-flanking region	0.014	TAGB_DICDI	PRESTALK-SPECIFIC PROTEIN TAGB PRECURSOR (EC 3.4.21.-)	7.6
655	M29930	Human insulin receptor (allele 2) gene, exons 14, 15, 16 and 17.	8.00E-08	<NONE>	<NONE>	<NONE>
656	U78310	Homo sapiens pescadillo mRNA, complete cds	0	YG2S_YEAST	HYPOTHETICAL 69.9 KD PROTEIN IN MIC1-SRB5 INTERGENIC REGION	0.002
657	X68792	S.coelicolor A3(2) promoter sequence pth270	3.2	YBS0_YEAST	HYPOTHETICAL 27.0 KD PROTEIN IN VAL1-HSP26 INTERGENIC REGION	0.073
658	U50535	Human BRCA2 region, mRNA sequence CG006	4.00E-12	ALU1_HUMAN	!!!! ALU SUBFAMILY J WARNING ENTRY !!!!	1.2

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
659	U15522	Sus scrofa clone pvg1a Ig heavy chain variable VDJ region mRNA, partial cds.	3.2	Z165_HUMAN	ZINC FINGER PROTEIN 165	3.2
660	M20918	C.thummi piger haemoglobin (Hb) gene DNA, complete cds.	0.12	YT25_CAEEL	HYPOTHETICAL 59.9 KD PROTEIN B0304.5 IN CHROMOSOME II	0.033
661	U60337	Homo sapiens beta-mannosidase mRNA, complete cds	0	<NONE>	<NONE>	<NONE>
662	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	0.001	ENV_MLVFP	ENV POLYPROTEIN PRECURSOR (CONTAINS: KNOB PROTEIN GP70; SPIKE PROTEIN P15E; R PROTEIN)	3.3
663	M97287	Human MAR/SAR DNA binding protein (SATB1) mRNA, complete cds. > :: gb I58691 I58691 Sequence 1 from patent US 5652340	0	SAT1_HUMAN	DNA-BINDING PROTEIN SATB1 (SPECIAL AT-RICH SEQUENCE BINDING PROTEIN 1)	2.00E-20
664	L42612	Homo sapiens keratin 6 isoform K6f (KRT6F) mRNA, complete cds	e-168	K2C4_BOVIN	KERATIN, TYPE II CYTOSKELETAL 59 KD, COMPONENT IV	4.00E-10
665	U17901	Rattus norvegicus phospholipase A-2-activating protein (plap) mRNA, complete cds.	e-152	PLAP_MOUSE	PHOSPHOLIPASE A-2-ACTIVATING PROTEIN (PLAP)	4.00E-13
666	M73047	Homo sapiens tripeptidyl peptidase II mRNA, complete cds.	0	MERT_STRLI	MERCURIC TRANSPORT PROTEIN (MERCURY ION TRANSPORT PROTEIN)	4.4

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
667	U09954	Human ribosomal protein L9 gene, 5' region and complete cds.	0	RL9_HUMAN	60S RIBOSOMAL PROTEIN L9	2.00E-11
668	X98330	H.sapiens mRNA for ryanodine receptor 2	1.1	HS74_MOUSE	HEAT SHOCK 70 KD PROTEIN AGP-2	0.034
669	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	0.002	RPC2_DROME	DNA-DIRECTED RNA POLYMERASE III 128 KD POLYPEPTIDE	1.1
670	AF069250	Homo sapiens okadaic acid-inducible phosphoprotein (OA48-18) mRNA, complete cds	7.00E-80	LEGB_PEA	LEGUMIN B (FRAGMENT)	0.011
671	Z71419	S.cerevisiae chromosome XIV reading frame ORF YNL143c	1.1	FOCD_ECOLI	OUTER MEMBRANE USHER PROTEIN FOCD PRECURSOR	9.7
672	AF044965	Homo sapiens polio virus related protein 2 gene, alpha isoform, exon 6 and partial cds	e-167	PVR_MOUSE	POLIOVIRUS RECEPTOR HOMOLOG PRECURSOR	1.00E-12
673	X65319	Cloning vector pCAT-Enhancer	2.00E-80	S106_HUMAN	CALCYCLIN (PROLACTIN RECEPTOR ASSOCIATED PROTEIN) CALCIUM-BINDING PROTEIN A6)	3.00E-15
674	D29655	Pig mRNA for UMP-CMP kinase, complete cds	e-103	V319_ASFB7	J319 PROTEIN	4.3
675	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	8.00E-08	VEGR_RAT	VASCULAR ENDOTHELIAL GROWTH FACTOR RECEPTOR 1 PRECURSOR RECEPTOR FLT) (FLT-1)	3.3

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
676	D90217	S. cerevisiae gene for YmL33, mitochondrial ribosomal proteins of large subunit	2.00E-07	MALY_ECOLI	MALY PROTEIN (EC 2.6.1.-)	5.6
677	AF038952	Homo sapiens cofactor A protein mRNA, complete cds	e-160	T1CA_MOUSE	TCPI-CHAPERONIN COFACTOR A	4.00E-19
678	Z96950	Gorilla gorilla DNA sequence orthologous to the human Xp:Yp telomere-junction region	5.00E-14	YHBZ_ECOLI	HYPOTHETICAL 43.3 KD GTP-BINDING PROTEIN IN DACB-RPMA INTERGENIC REGION (F390)	3.3
679	D50418	Mouse mRNA for AREC3, partial cds	2.00E-79	CYGX_RAT	OLFACTORY GUANYLYL CYCLASE GC-D PRECURSOR (EC 4.6.1.2)	1.1
680	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	8.00E-08	P2C2_SCHPO	PROTEIN PHOSPHATASE 2C HOMOLOG 2 (EC 3.1.3.16)	1.00E-04
681	AL010280	Plasmodium falciparum DNA *** SEQUENCING IN PROGRESS *** from contig 4-106, complete sequence	0.12	<NONE>	<NONE>	<NONE>
682	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	5.00E-04	VSM2_TRYBB	VARIANT SURFACE GLYCOPROTEIN MITAT 1.2 PRECURSOR (VSG 221)	4.3
683	U00238	Homo sapiens glutamine PRPP amidotransferase (GPAT) mRNA, complete cds	0	<NONE>	<NONE>	<NONE>
684	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	0.005	PRPR_SALTY	PROPIONATE CATABOLISM OPERON REGULATORY PROTEIN	1.5

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
685	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	7.00E-07	YAND_SCHPO	HYPOTHETICAL 30.4 KD PROTEIN C3H1.13 IN CHROMOSOME I	0.38
686	D25538	Human mRNA for KIAA0037 gene, complete cds	0	<NONE>	<NONE>	<NONE>
687	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	2.00E-07	A1AA_RAT	ALPHA-1A ADRENERGIC RECEPTOR (RA42)	4.4
688	L26956	Mesocricetus auratus stearyl-CoA desaturase sequence including male hormone dependent gene derived from hamster frankorgan	4.00E-33	<NONE>	<NONE>	<NONE>
689	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-10	<NONE>	<NONE>	<NONE>
690	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-09	YO93_CAEEL	HYPOTHETICAL 58.5 KD PROTEIN T20B12.3 IN CHROMOSOME III	2.00E-08
691	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	8.00E-09	<NONE>	<NONE>	<NONE>
692	AB017026	Mus musculus mRNA for oxysterol-binding protein, complete cds	0	OXYB_RABIT	OXYSTEROL-BINDING PROTEIN	1.00E-34
693	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	6.00E-04	UFO2_MAIZE	FLAVONOL 3-O-GLUCOSYLTRANSFERASE (EC 2.4.1.91)	3.1

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
694	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	5.00E-04	<NONE>	<NONE>	<NONE>
695	U34954	Caenorhabditis elegans cyclophilin isoform 10	5.00E-24	CYPA_CAEEL	PEPTIDYL-PROLYL CIS-TRANS ISOMERASE 10 (EC 5.2.1.8)	2.00E-29
696	AB011167	Homo sapiens mRNA for KIAA0595 protein, partial cds	0	RFX5_HUMAN	BINDING REGULATORY FACTOR	2.1
697	U03886	Human GS2 mRNA, complete cds.	2.00E-28	SKD1_MOUSE	SKD1 PROTEIN	4.00E-17
698	AF086275	Homo sapiens full length insert cDNA clone ZD45C02	3.00E-41	SPT7_YEAST	TRANSCRIPTIONAL ACTIVATOR SPT7	0.82
699	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-10	CA1E_HUMAN	COLLAGEN ALPHA 1(XV) CHAIN PRECURSOR	1.1
700	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	4.00E-11	E434_ADECC	Q65962 canine adenovirus type 1 (strain cl1). early e4 31 kd protein. 11/98	4.4
701	L17340	Drosophila melanogaster germline transcription factor gene, complete cds.	3.3	CISY_TETH	CITRATE SYNTHASE, MITOCHONDRIAL PRECURSOR (EC 4.1.3.7) (14 NM FILAMENT-FORMING PROTEIN)	9.7
702	X58170	M.musculus mRNA for t-Complex Tcp-10a gene	2.00E-45	PME2_LYCES	PECTINESTERASE 2 PRECURSOR (EC 3.1.1.11) (PECTIN METHYLESTERASE) (PE 2)	7.4
703	Z96207	H.sapiens telomeric DNA sequence, clone 12PTEL049, read 12PTELOO049.se	8.00E-08	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
		q				
704	X58430	Human Hox1.8 gene	e-146	HXAA_HUMAN	HOMEODOMAIN PROTEIN HOX-A10 (HOX-1H) (HOX-1.8) (PL)	4.00E-05
705	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	6.00E-06	YN39_SYNP7	HYPOTHETICAL 9.2 KD PROTEIN IN CYST-CYSR INTERGENIC REGION (ORF 81)	0.89
706	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	1.00E-11	MYSH_BOVIN	MYOSIN I HEAVY CHAIN-LIKE PROTEIN (MIHC) (BRUSH BORDER MYOSIN I) (BBMI)	0.001
707	M19961	Human cytochrome c oxidase subunit Vb (coxVb) mRNA, complete cds.	e-123	OTHU5B	<NONE>	3.00E-30
708	X68380	M.musculus gene for cathepsin D, exon 3	5.00E-04	42_MOUSE	ERYTHROCYTE MEMBRANE PROTEIN BAND 4.2 (P4.2) (PALLIDIN)	9.9
709	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	1.00E-11	TCPA_DROME	T-COMPLEX PROTEIN 1, ALPHA SUBUNIT (TCP-1-ALPHA)	4.3
710	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-10	<NONE>	<NONE>	<NONE>
711	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	4.00E-12	<NONE>	<NONE>	<NONE>
712	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	0.002	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
713	AB018323	Homo sapiens mRNA for KIAA0780 protein, partial cds	3.00E-41	LBR_CHICK	LAMIN B RECEPTOR	3.4
714	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	6.00E-06	YM8L_YEAST	HYPOTHETICAL 71.1 KD PROTEIN IN DSK2-CAT8 INTERGENIC REGION	3.00E-08
715	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	4.00E-13	PSC_DROME	POSTERIOR SEX COMBS PROTEIN	0.6
716	L28101	Homo sapiens kallistatin (PI4) gene, exons 1-4, complete cds	7.00E-07	IRKX_RAT	INWARD RECTIFIER POTASSIUM CHANNEL BIR9 (KIR5.1)	5.4
717	AC001038	Homo sapiens (subclone 2_h2 from P1 H49) DNA sequence	8.00E-09	MGMT_YEAST	METHYLATED-DNA--PROTEIN-CYSTEINE METHYLTRANSFERASE	0.48
718	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	1.00E-11	YWDE_BACSU	HYPOTHETICAL 19.9 KD PROTEIN IN SACA-UNG INTERGENIC REGION PRECURSOR	1.8
719	U01139	Mus musculus B6D2F1 clone 2C11B mRNA.	e-110	GSC_DROME	HOMEODOMAIN PROTEIN GOOSECOID	7.2
720	AB017430	Homo sapiens mRNA for kinesin-like DNA binding protein, complete cds	0	YBAV_ECOLI	HYPOTHETICAL 12.7 KD PROTEIN IN HUPB-COF INTERGENIC REGION	0.17
721	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	0.001	CPCF_SYNP2	PHYCOCYANOBILIN LYASE BETA SUBUNIT (EC 4.1.1.1)	2.4
722	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	9.00E-10	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
723	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	0.04	YKK7_CAEEL	HYPOTHETICAL 54.9 KD PROTEIN C02F5.7 IN CHROMOSOME III	0.057
724	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	8.00E-08	H5_CAIMO	HISTONE H5	0.39
725	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	3.00E-09	DED1_YEAST	PUTATIVE ATP-DEPENDENT RNA HELICASE DED1	0.5
726	J04617	Human elongation factor EF-1-alpha gene, complete cds. > :: dbj E02629 E02629 DNA of human polypeptide chain elongation factor-1 alpha	5.00E-36	ALU7_HUMAN	!!!! ALU SUBFAMILY SQ WARNING ENTRY !!!!	0.84
727	X54859	Porcine TNF-alpha and TNF-beta genes for tumour necrosis factors alpha and beta, respectively.	3.3	Z165_HUMAN	ZINC FINGER PROTEIN 165	5.6
728	D49911	Thermus thermophilus UvrA gene, complete cds	0.014	CC48_CAPAN	CELL DIVISION CYCLE PROTEIN 48 HOMOLOG	9.9
729	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	2.00E-06	CA25_HUMAN	PROCOLLAGEN ALPHA 2(V) CHAIN PRECURSOR	0.011
730	D15057	Human mRNA for DAD-1, complete cds	0	DAD1_HUMAN	DEFENDER AGAINST CELL DEATH 1 (DAD-1)	8.00E-16
731	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	6.00E-06	ANFD_RHOCA	NITROGENASE IRON-IRON PROTEIN ALPHA CHAIN (EC 1.18.6.1) (NITROGENASE COMPONENT I) (DINITROGENASE	9.6

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
)	
732	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	7.00E-07	EFTU_CHLVI	ELONGATION FACTOR TU (EF-TU)	2.5
733	AB018335	Homo sapiens mRNA for KIAA0792 protein, complete cds	0	TRYM_RAT	MAST CELL TRYPTASE PRECURSOR (EC 3.4.21.59)	5.6
734	X98743	H.sapiens mRNA for RNA helicase (Myc-regulated dead box protein)	0.04	<NONE>	<NONE>	<NONE>
735	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	2.00E-07	<NONE>	<NONE>	<NONE>
736	Z49314	S.cerevisiae chromosome X reading frame ORF YJL039c	3.2	<NONE>	<NONE>	<NONE>
737	D12646	Mouse kif4 mRNA for microtubule-based motor protein KIF4, complete cds	0	KIF4_MOUSE	KINESIN-LIKE PROTEIN KIF4	2.00E-76
738	J04038	Human glyceraldehyde-3-phosphate dehydrogenase	2.00E-47	SDC1_HUMAN	SYNDECAN-1 PRECURSOR (SYND1) (CD138)	3.5
739	AF010238	Homo sapiens von Hippel-Lindau tumor suppressor	1.00E-09	LIN1_HUMAN	LINE-1 REVERSE TRANSCRIPTASE HOMOLOG	0.001
740	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	2.00E-06	YQJX_BACSU	HYPOTHETICAL 13.2 KD PROTEIN IN GLNQ-ANSR INTERGENIC REGION	9.9

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
741	L21186	Human lysyl oxidase-like protein mRNA, complete cds.	e-145	OXRTL	<NONE>	1.00E-34
742	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	2.00E-05	CC48_SOYBN	CELL DIVISION CYCLE PROTEIN 48 HOMOLOG (VALOSIN CONTAINING PROTEIN HOMOLOG) (VCP)	7.6
743	AF009203	Homo sapiens YAC clone 377A1 unknown mRNA, 3'untranslated region	3.3	<NONE>	<NONE>	<NONE>
744	Z74894	S.cerevisiae chromosome XV reading frame ORF YOL152w	0.12	CD14_RABIT	Q28680 oryctolagus cuniculus (rabbit). monocyte differentiation antigen cd14 precursor. 11/98	1.9
745	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	9.00E-10	KIN3_YEAST	SERINE/THREONINE-PROTEIN KINASE KIN3 (EC 2.7.1.-)	2.5
746	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	2.00E-05	YA53_SCHPO	HYPOTHETICAL 24.2 KD PROTEIN C13A11.03 IN CHROMOSOME I	7.00E-17
747	S61044	ALDH3=aldehyde dehydrogenase isozyme 3 [human, stomach, mRNA Partial, 1362 nt]	0	DHAP_HUMAN	ALDEHYDE DEHYDROGENASE, DIMERIC NADP-PREFERRING (EC 1.2.1.5) (CLASS 3)	2.00E-71
748	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	2.00E-08	CA1E_CHICK	COLLAGEN ALPHA 1(XIV) CHAIN PRECURSOR (UNDULIN)	0.36
749	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	7.00E-06	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
750	L14815	Entamoeba histolytica HM-1:IMSS galactose-specific adhesin 170kD subunit (hgl3) gene, complete cds.	0.12	<NONE>	<NONE>	<NONE>
751	X63785	T.thermophila gene for snRNA U2-2	1.1	<NONE>	<NONE>	<NONE>
752	M83756	Mytilus edulis mitochondrial NADH dehydrogenase subunit 5 (ND5) gene, 3' end; NADH dehydrogenase subunit 6 (ND6) gene, complete cds; and cytochrome b (cyt b), 5' end.	0.042	DSC1_HUMAN	DESMOCOLLIN 1A/1B PRECURSOR (DESMOSOMAL GLYCOPROTEIN 2/3) (DG2 / DG3)	2.6
753	AB001066	Brown trout microsatellite DNA sequence	0.38	IMB3_HUMAN	IMPORTIN BETA-3 SUBUNIT (KARYOPHERIN BETA-3 SUBUNIT)	1.2
754	AF064787	Lotus japonicus rac GTPase activating protein 1 mRNA, complete cds	0.51	<NONE>	<NONE>	<NONE>
755	U20608	Dictyostelium discoideum unknown spore germination-specific protein-like protein, orf1, orf2 and orf3 genes, complete cds	0.043	<NONE>	<NONE>	<NONE>
756	M77812	Rabbit myosin heavy chain mRNA, complete cds.	1.2	RBL1_HUMAN	RETINOBLASTOMA-LIKE PROTEIN 1 (107 KD RETINOBLASTOMA-ASSOCIATED PROTEIN) (PRB1) (P107)	4.9

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
757	X63789	T.thermophila genes for snRNA U5-1, snRNA U5-2	0.058	<NONE>	<NONE>	<NONE>
758	D50646	Mouse mRNA for SDF2, complete cds	2.00E-27	PMT3_YEAST	DOLICHYL-PHOSPHATE-MANNOSE--PROTEIN MANNOSYLTRANSFERASE 3 (EC 2.4.1.109)	0.002
759	L81583	Homo sapiens (subclone 3_g2 from P1 H11) DNA sequence	3.00E-19	ALU5_HUMAN	!!!! ALU SUBFAMILY SC WARNING ENTRY !!!!	0.86
760	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	2.00E-06	SYFA_YEAST	PHENYLALANYL-TRNA SYNTHETASE ALPHA CHAIN CYTOPLASMIC	5.7
761	AF000370	Homo sapiens polymorphic CA dinucleotide repeat flanking region	6.00E-89	APP1_MOUSE	AMYLOID-LIKE PROTEIN 1 PRECURSOR (APLP)	5.7
762	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	0.002	<NONE>	<NONE>	<NONE>
763	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	7.00E-06	PSF_HUMAN	PTB-ASSOCIATED SPLICING FACTOR (PSF)	0.72
764	AB018288	Homo sapiens mRNA for KIAA0745 protein, partial cds	0	TC2A_CAEBR	TRANSPOSABLE ELEMENT TCB2 TRANSPOSASE	1.5
765	AF020282	Dictyostelium discoideum DG2033 gene, partial cds	0.38	PMT2_YEAST	DOLICHYL-PHOSPHATE-MANNOSE--PROTEIN MANNOSYLTRANSFERASE 2 (EC 2.4.1.109)	0.18

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
766	AF017357	Oryza sativa low molecular early light-inducible protein mRNA, complete cds	0.38	RGS3_HUMAN	REGULATOR OF G-PROTEIN SIGNALLING 3 (RGS3) (RGP3)	0.23
767	U67599	Methanococcus jannaschii section 141 of 150 of the complete genome	0.13	<NONE>	<NONE>	<NONE>
768	X74178	B.taurus microsatellite DNA INRA153	0.13	FAG1_SYNY3	P73574 synechocystis sp. (strain pcc 6803). 3-oxoacyl-[acyl-carrier protein] reductase 1 (ec 1.1.1.100) (3-ketoacyl- acyl carrier protein reductase 1). 11/98	5.00E-16
769	AF041858	Mus musculus synaptojanin 2 isoform delta mRNA, partial cds	0.043	CA44_HUMAN	COLLAGEN ALPHA 4(IV) CHAIN PRECURSOR	0.24
770	J01404	Drosophila melanogaster mitochondrial cytochrome c oxidase subunits, ATPase6, 7 tRNAs (Trp, Cys, Tyr, Leu(UUR), Lys, Asp, Gly) genes, and unidentified reading frames A6l, 2 and 3.	0.021	NU1M_CITLA	NADH-UBIQUINONE OXIDOREDUCTAS E CHAIN 1 (EC 1.6.5.3)	7.2
771	AL022317	Human DNA sequence from clone 140L1 on chromosome 22q13.1-13.31, complete sequence [Homo sapiens]	3.00E-41	ALU7_HUMAN	!!!! ALU SUBFAMILY SQ WARNING ENTRY !!!!	4.00E-08
772	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	1.00E-09	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
773	AF095927	Rattus norvegicus protein phosphatase 2C mRNA, complete cds	0	P2C_PARTE	PROTEIN PHOSPHATASE 2C (EC 3.1.3.16) (PP2C)	1.00E-16
774	X87212	H.sapiens mRNA for cathepsin C	0	CATC_HUMAN	DIPEPTIDYL-PEPTIDASE I PRECURSOR (EC 3.4.14.1)	2.00E-46
775	X05283	Drosophila melanogaster PKCG7 gene exons 7-14 for protein kinase C	4.5	<NONE>	<NONE>	<NONE>
776	X03558	Human mRNA for elongation factor 1 alpha subunit	0	EF11_HUMAN	ELONGATION FACTOR 1-ALPHA 1 (EF-1-ALPHA-1)	1.00E-83
777	X06960	Aspergillus nidulans mitochondrial DNA for cytochrome oxidase subunit 3, tRNA-Tyr	0.23	<NONE>	<NONE>	<NONE>
778	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	3.00E-09	YMT8_YEAST	HYPOTHETICAL 36.4 KD PROTEIN IN NUP116-FAR3 INTERGENIC REGION	5.00E-07
779	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	2.00E-07	NAT1_YEAST	N-TERMINAL ACETYLTRANSFERASE 1 (EC 2.3.1.88)	5.00E-23
780	U59706	Gallus gallus alternatively spliced AMPA glutamate receptor, isoform GluR2 flop, (GluR2) mRNA, partial cds.	0.014	PPOL_SARPE	POLY (ADP-RIBOSE) POLYMERASE (EC 2.4.2.30) (PARP)	0.021
781	U57391	Rattus norvegicus FceRI gamma-chain interacting protein SH2-B (SH2-B) mRNA, complete cds	1.00E-84	<NONE>	<NONE>	<NONE>

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
782	AB014591	Homo sapiens mRNA for KIAA0691 protein, complete cds	7.00E-57	SSGP_VOLCA	SULFATED SURFACE GLYCOPROTEIN 185 (SSG 185)	5.3
783	AJ008065	Chrysolina bankii 16S rRNA gene, mitotype B2	0.043	<NONE>	<NONE>	<NONE>
784	AF067212	Caenorhabditis elegans cosmid F37F2	0.005	MEK1_RAT	MAPK/ERK KINASE KINASE 1 (EC 2.7.1.-) (MEK KINASE 1)	4.5
785	U95094	Xenopus laevis XL-INCENP (XL-INCENP) mRNA, complete cds	0.042	<NONE>	<NONE>	<NONE>
786	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	9.00E-09	<NONE>	<NONE>	<NONE>
787	Y13401	Homo sapiens CD3 delta gene, enhancer sequence	8.00E-08	<NONE>	<NONE>	<NONE>
788	AE001038	Archaeoglobus fulgidus section 69 of 172 of the complete genome	0.13	<NONE>	<NONE>	<NONE>
789	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	2.00E-06	<NONE>	<NONE>	<NONE>
790	AF041463	Manihot esculenta elongation factor 1-alpha	1.4	<NONE>	<NONE>	<NONE>
791	U95102	Xenopus laevis mitotic phosphoprotein 90 mRNA, complete cds	0.002	HXA3_HAEIN	HEME:HEMOPEXIN-BINDING PROTEIN PRECURSOR	2.7
792	Z12112	pWE15A cosmid vector DNA	3.00E-29	PKWA_THECU	PUTATIVE SERINE/THREONINE-PROTEIN KINASE PKWA (EC 2.7.1.-)	2.00E-04

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
793	U85193	Human nuclear factor I-B2 (NFIB2) mRNA, complete cds	4.00E-44	<NONE>	<NONE>	<NONE>
794	U89331	Human pseudoautosomal homeodomain-containing protein (PHOG) mRNA, complete cds	7.00E-06	NRL_HUMAN	NEURAL RETINA-SPECIFIC LEUCINE ZIPPER PROTEIN (NRL)	6.3
795	AF055666	Mus musculus kinesin light chain 2 (Klc2) mRNA, complete cds	0.52	PSPD_BOVIN	PULMONARY SURFACTANT-ASSOCIATED PROTEIN D PRECURSOR	0.33
796	L13321	Homo sapiens iduronate-2-sulfatase (IDS) gene, exon 1, incomplete 5' end.	0.14	YRP2_YEAST	HYPOTHETICAL 84.4 KD PROTEIN IN RPC2/RET1 3'REGION	0.27
797	AL010270	Plasmodium falciparum DNA *** SEQUENCING IN PROGRESS *** from contig 4-96, complete sequence	0.37	YTH3_CAEEL	HYPOTHETICAL 75.5 KD PROTEIN C14A4.3 IN CHROMOSOME II	2
798	U95098	Xenopus laevis mitotic phosphoprotein 44 mRNA, partial cds	0.015	IMB3_HUMAN	IMPORTIN BETA-3 SUBUNIT (KARYOPHERIN BETA-3 SUBUNIT)	0.063
799	U70139	Mus musculus putative CCR4 protein mRNA, partial cds	0	CCR4_YEAST	GLUCOSE-REPRESSIBLE ALCOHOL DEHYDROGENASE TRANSCRIPTIONAL EFFECTOR (CARBON CATABOLITE REPRESSOR PROTEIN 4)	5.00E-11
800	L26507	Mouse myocyte nuclear factor (MNF) mRNA, complete cds.	3.00E-41	MNF_MOUSE	MYOCYTE NUCLEAR FACTOR (MNF)	4.00E-18

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
801	U20527	Mus musculus chemokine KC gene, 5' region.	0	GRO_MOUSE	GROWTH REGULATED PROTEIN PRECURSOR (PLATELET-DERIVED GROWTH FACTOR-INDUCIBLE PROTEIN KC) (SECRETORY PROTEIN N51)	1.00E-28
802	AF065482	Homo sapiens sorting nexin 2 (SNX2) mRNA, complete cds	0	MYSA_DROME	MYOSIN HEAVY CHAIN, MUSCLE	0.089
803	U05823	Mus musculus pericentrin mRNA, complete cds.	1.00E-94	M84D_DROME	MALE SPECIFIC SPERM PROTEIN MST84DD	0.099
804	U67468	Methanococcus jannaschii section 10 of 150 of the complete genome	0.4	<NONE>	<NONE>	<NONE>
805	U14178	Human type II IL-1 receptor gene, exon 1B	1.00E-19	AMPH_HUMAN	AMPHIPHYSIN	2.9
806	L40411	Homo sapiens thyroid receptor interactor	0	TRI8_HUMAN	THYROID RECEPTOR INTERACTING PROTEIN 8 (TRIP8)	4.00E-86
807	D17218	Human HepG2 3' region Mbol cDNA, clone hmd3g02m3	e-136	CA1A_HUMAN	COLLAGEN ALPHA 1(X) CHAIN PRECURSOR	3.00E-04
808	Z57610	H.sapiens CpG DNA, clone 187a10, reverse read cpg187a10.rt1a .	e-102	HN3B_MOUSE	HEPATOCYTE NUCLEAR FACTOR 3-BETA (HNF-3B)	1.00E-24
809	D14678	Human mRNA for kinesin-related protein, partial cds	0	NCD_DROME	CLARET SEGREGATIONAL PROTEIN	1.00E-70

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
810	X56317	Xiphophorus maculatus Xmrk(proto-oncogene) gene for receptor tyrosine kinase.	0.49	WN1B_MOUSE	WNT-10B PROTEIN PRECURSOR (WNT-12)	7.2
811	M36200	Human synaptobrevin 1 (SYB1) gene, exon 5.	0.2	VE2_HPV14	REGULATORY PROTEIN E2	3.1
812	M18157	Human glandular kallikrein gene, complete cds.	1.5	EKLF_MOUSE	ERYTHROID KRUEPPEL-LIKE TRANSCRIPTION FACTOR (EKLF)	1.1
813	D25215	Human mRNA for KIAA0032 gene, complete cds	1.9	YXIS_SACER	HYPOTHETICAL 28.9 KD PROTEIN IN XIS 5'REGION (ORF1)	1.3
814	M96628	Human gene sequence, 5' end.	2.00E-06	AGRI_DISOM	AGRIN (FRAGMENT)	9.5
815	Z57610	H.sapiens CpG DNA, clone 187a10, reverse read cpg187a10.rt1a .	e-102	HN3B_MOUSE	HEPATOCYTE NUCLEAR FACTOR 3-BETA (HNF-3B)	1.00E-19
816	X14168	Human pLC46 with DNA replication origin	5.00E-16	ZN44_HUMAN	ZINC FINGER PROTEIN 44 (ZINC FINGER PROTEIN KOX7)	1.6
817	M19262	Rat clathrin light chain (LCB3) mRNA, complete cds.	0.28	LMA_DROME	LAMININ ALPHA CHAIN PRECURSOR	4.7
818	AF058055	Mus musculus monocarboxylate transporter 1	0.2	<NONE>	<NONE>	<NONE>
819	AB014570	Homo sapiens mRNA for KIAA0670 protein, partial cds	0.16	YGR1_YEAST	HYPOTHETICAL 34.8 KD PROTEIN IN SUT1-RCK1 INTERGENIC REGION	4.00E-06
820	M19262	Rat clathrin light chain (LCB3) mRNA, complete cds.	0.27	LMA_DROME	LAMININ ALPHA CHAIN PRECURSOR	4.5

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
821	Z54367	H.sapiens gene for plectin	0.29	YO93_CAEEL	HYPOTHETICAL 58.5 KD PROTEIN T20B12.3 IN CHROMOSOME III	1.00E-14
822	AB017026	Mus musculus mRNA for oxysterol-binding protein, complete cds	0	OXYB_HUMAN	OXYSTEROL-BINDING PROTEIN	2.00E-49
823	X58170	M.musculus mRNA for t-Complex Tcp-10a gene	1.00E-20	UL52_HSV11	DNA HELICASE/PRIMASE COMPLEX PROTEIN (DNA REPLICATION PROTEIN UL52)	5.3
824	X58430	Human Hox1.8 gene	0	HXAA_HUMAN	HOMEODOMAIN PROTEIN HOX-A10 (HOX-1H) (HOX-1.8) (PL)	1.00E-44
825	X53754	Porcine sarcoplasmic/endoplasmic-reticulum Ca(2+) pump gene 2 3'-end region	1.3	<NONE>	<NONE>	<NONE>
826	AB005786	Arabidopsis thaliana tRNA-Glu gene	0.46	<NONE>	<NONE>	<NONE>
827	AB012130	Homo sapiens SBC2 mRNA for sodium bicarbonate cotransporter2, complete cds	1.9	<NONE>	<NONE>	<NONE>
828	AB017430	Homo sapiens mRNA for kinesin-like DNA binding protein, complete cds	0	YBAV_ECOLI	HYPOTHETICAL 12.7 KD PROTEIN IN HUPB-COF INTERGENIC REGION	0.063
829	AB007886	Homo sapiens KIAA0426 mRNA, complete cds	0.042	YDF3_SCHPO	PROBABLE EUKARYOTIC INITIATION FACTOR C17C9.03	0.52
830	AB018335	Homo sapiens mRNA for KIAA0792 protein, complete cds	e-172	UROT_BOVIN	TISSUE PLASMINOGEN ACTIVATOR PRECURSOR (EC 3.4.21.68)	0.86

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
831	D12646	Mouse kif4 mRNA for microtubule-based motor protein KIF4, complete cds	0	KIF4_MOUSE	KINESIN-LIKE PROTEIN KIF4	9.00E-96
832	U38376	Rattus norvegicus cytosolic phospholipase A2 mRNA, complete cds	0.048	<NONE>	<NONE>	<NONE>
833	L40411	Homo sapiens thyroid receptor interactor	0	TRI8_HUMAN	THYROID RECEPTOR INTERACTING PROTEIN 8 (TRIP8)	4.00E-86
834	U08110	Mus musculus RNA1 homolog (Fug1) mRNA, complete cds.	8.00E-04	YNW7_YEAST	HYPOTHETICAL 68.8 KD PROTEIN IN URE2-SSU72 INTERGENIC REGION	0.02
835	D50646	Mouse mRNA for SDF2, complete cds	1.00E-40	YB64_YEAST	HYPOTHETICAL 57.2 KD PROTEIN IN MET8-HPC2 INTERGENIC REGION	4.9
836	D50646	Mouse mRNA for SDF2, complete cds	1.00E-40	YB64_YEAST	HYPOTHETICAL 57.2 KD PROTEIN IN MET8-HPC2 INTERGENIC REGION	4.9
837	U67459	Methanococcus jannaschii section 1 of 150 of the complete genome	5.00E-05	GCS1_HUMAN	MANNOSYL-OLIGOSACCHARIDE GLUCOSIDASE (EC 3.2.1.106)	9.2
838	U18657	Haemophilus influenzae LeuA (leuA) gene, partial cds, DprA (dprA+), orf272 and orf193 genes, complete cds, and PfkA (pfkA) gene, partial cds.	0.01	STE6_YEAST	MATING FACTOR A SECRETION PROTEIN STE6 (MULTIPLE DRUG RESISTANCE PROTEIN HOMOLOG) (P-GLYCOPROTEIN)	7

Table 2

SEQ ID	Nearest Neighbor (BlastN vs. Genbank)			Nearest Neighbor (BlastX vs. Non-Redundant Proteins)		
	ACCESSION	DESCRIPTION	P VALUE	ACCESSION	DESCRIPTION	P VALUE
839	U12523	Rattus norvegicus ultraviolet B radiation-activated UV98 mRNA, partial sequence.	1.00E-10	YMT8_YEAST	HYPOTHETICAL 36.4 KD PROTEIN IN NUP116-FAR3 INTERGENIC REGION	2.00E-06
840	D78255	Mouse mRNA for PAP-1, complete cds	e-175	<NONE>	<NONE>	<NONE>
841	D17263	Human HepG2 3' region Mbol cDNA, clone hmd5f07m3	1.00E-58	<NONE>	<NONE>	<NONE>
842	AF006751	Homo sapiens ES/130 mRNA, complete cds	0.061	YRP2_YEAST	HYPOTHETICAL 84.4 KD PROTEIN IN RPC2/RET1 3'REGION	2.00E-07
843	U67459	Methanococcus jannaschii section 1 of 150 of the complete genome	6.00E-05	YC14_METJA	HYPOTHETICAL PROTEIN MJ1214	8.1
844	D88689	Mus musculus mRNA for flt-1, complete cds	0.084	ICP0_HSV2H	TRANS-ACTING TRANSCRIPTIONAL PROTEIN ICP0 (VMW118 PROTEIN)	0.014

Table 5 All Differential Data for Libs 1-4 and 8-9

Clone Name	Cluster ID	Clones in Lib1	Clones in Lib2	Clones in Lib3	Clones in Lib4	Clones in Lib8	Clones in Lib9
M00001340B:A06	17062	3	0	0	0	0	0
M00001340D:F10	11589	2	2	1	3	3	8
M00001341A:E12	4443	10	6	2	6	3	11
M00001342B:E06	39805	2	0	0	0	1	0
M00001343C:F10	2790	7	15	13	14	6	0
M00001343D:H07	23255	3	0	1	1	0	0
M00001345A:E01	6420	8	0	2	0	1	0
M00001346A:F09	5007	4	8	3	6	2	6
M00001346D:E03	6806	5	2	1	2	0	3
M00001346D:G06	5779	5	4	3	4	0	0
M00001346D:G06	5779	5	4	3	4	0	0
M00001347A:B10	13576	5	0	0	0	12	11
M00001348B:B04	16927	4	0	0	2	0	0
M00001348B:G06	16985	4	0	0	0	0	0
M00001349B:B08	3584	5	11	5	0	0	2
M00001350A:H01	7187	5	3	1	0	1	0
M00001351B:A08	3162	10	14	1	6	6	5
M00001351B:A08	3162	10	14	1	6	6	5
M00001352A:E02	16245	4	0	0	0	0	0
M00001353A:G12	8078	4	3	1	0	1	0
M00001353D:D10	14929	4	0	0	1	23	16
M00001355B:G10	14391	3	1	0	0	0	0
M00001357D:D11	4059	8	6	8	16	0	1
M00001361A:A05	4141	5	2	10	16	4	27
M00001361D:F08	2379	26	13	4	2	2	3
M00001362B:D10	5622	7	4	2	13	1	2
M00001362C:H11	945	9	21	2	1	0	0
M00001365C:C10	40132	2	0	0	0	3	0
M00001370A:C09	6867	7	3	0	0	0	0
M00001371C:E09	7172	3	5	1	2	0	1
M00001376B:G06	17732	1	3	5	0	1	4
M00001378B:B02	39833	2	0	0	0	0	0
M00001379A:A05	1334	27	38	35	28	3	0
M00001380D:B09	39886	2	0	0	0	0	0
M00001382C:A02	22979	2	1	0	0	0	0
M00001383A:C03	39648	2	0	0	0	0	0
M00001383A:C03	39648	2	0	0	0	0	0
M00001386C:B12	5178	5	5	4	2	5	2
M00001387A:C05	2464	5	19	25	16	1	0
M00001387B:G03	7587	6	2	1	0	0	0
M00001388D:G05	5832	10	3	0	1	5	0
M00001389A:C08	16269	3	0	0	0	1	1
M00001394A:F01	6583	2	7	3	2	0	0
M00001395A:C03	4016	5	14	0	6	0	0
M00001396A:C03	4009	6	4	13	5	4	10
M00001402A:E08	39563	2	0	0	0	0	0

Table 5 All Differential Data for Libs 1-4 and 8-9

Clone Name	Cluster ID	Clones in Lib1	Clones in Lib2	Clones in Lib3	Clones in Lib4	Clones in Lib8	Clones in Lib9
M00001407B:D11	5556	8	1	5	0	2	0
M00001409C:D12	9577	5	2	0	1	11	12
M00001410A:D07	7005	8	2	0	0	0	0
M00001412B:B10	8551	4	4	0	3	0	0
M00001415A:H06	13538	5	0	0	0	9	1
M00001416A:H01	7674	5	2	0	5	0	0
M00001416B:H11	8847	4	1	3	0	6	1
M00001417A:E02	36393	2	0	0	1	0	0
M00001418B:F03	9952	4	2	1	1	0	0
M00001418D:B06	8526	3	2	1	5	1	0
M00001421C:F01	9577	5	2	0	1	11	12
M00001423B:E07	15066	4	0	0	0	0	0
M00001424B:G09	10470	5	1	0	2	0	1
M00001425B:H08	22195	3	0	0	0	0	0
M00001426D:C08	4261	4	9	7	9	12	15
M00001428A:H10	84182	1	0	0	0	0	0
M00001429A:H04	2797	15	11	18	16	1	14
M00001429B:A11	4635	7	9	2	0	0	0
M00001429D:D07	40392	2	0	1	8	12	16
M00001439C:F08	40054	1	0	0	0	0	0
M00001442C:D07	16731	3	1	0	0	0	0
M00001445A:F05	13532	3	2	1	0	1	2
M00001446A:F05	7801	5	2	4	6	1	0
M00001447A:G03	10717	7	2	0	5	8	0
M00001448D:C09	8	1850	2127	1703	3133	1355	122
M00001448D:H01	36313	2	0	0	0	1	30
M00001449A:A12	5857	6	2	3	4	0	0
M00001449A:B12	41633	1	1	0	0	0	0
M00001449A:D12	3681	12	5	10	1	2	5
M00001449A:G10	36535	2	0	0	0	0	0
M00001449C:D06	86110	1	0	0	0	0	0
M00001450A:A02	39304	2	0	0	0	0	0
M00001450A:A11	32663	1	1	0	0	0	0
M00001450A:B12	82498	1	0	0	0	0	0
M00001450A:D08	27250	2	0	0	0	0	0
M00001452A:B04	84328	1	0	0	0	0	0
M00001452A:B12	86859	1	0	0	0	0	0
M00001452A:D08	1120	44	41	5	11	5	0
M00001452A:F05	85064	1	0	0	0	0	0
M00001452C:B06	16970	4	0	0	0	3	4
M00001453A:E11	16130	3	1	0	0	0	1
M00001453C:F06	16653	3	1	0	0	0	0
M00001454A:A09	83103	1	0	0	0	0	0
M00001454B:C12	7005	8	2	0	0	0	0
M00001454D:G03	689	58	95	17	36	66	95
M00001455A:E09	13238	4	1	0	0	0	0
M00001455B:E12	13072	4	1	0	0	0	0
M00001455D:F09	9283	4	1	0	1	0	1

Table 5 All Differential Data for Libs 1-4 and 8-9

Clone Name	Cluster ID	Clones in Lib1	Clones in Lib2	Clones in Lib3	Clones in Lib4	Clones in Lib8	Clones in Lib9
M00001455D:F09	9283	4	1	0	1	0	1
M00001460A:F06	2448	23	22	2	3	3	1
M00001460A:F12	39498	2	0	0	0	0	0
M00001461A:D06	1531	20	23	32	17	14	14
M00001463C:B11	19	1415	1203	1364	525	479	774
M00001465A:B11	10145	2	0	2	0	0	0
M00001466A:E07	4275	11	2	5	0	4	2
M00001467A:B07	38759	2	0	0	0	1	1
M00001467A:D04	39508	2	0	0	0	0	0
M00001467A:D08	16283	3	0	0	0	0	0
M00001467A:D08	16283	3	0	0	0	0	0
M00001467A:E10	39442	2	0	0	0	0	0
M00001468A:F05	7589	6	2	1	1	1	0
M00001469A:C10	12081	4	0	0	0	0	0
M00001469A:H12	19105	2	0	2	0	1	0
M00001470A:B10	1037	53	48	4	22	0	0
M00001470A:C04	39425	2	0	0	0	0	0
M00001471A:B01	39478	2	0	0	0	0	0
M00001481D:A05	7985	3	1	4	0	1	0
M00001490B:C04	18699	2	1	0	0	0	3
M00001494D:F06	7206	4	3	3	1	2	0
M00001497A:G02	2623	12	4	31	4	6	1
M00001499B:A11	10539	2	1	1	0	1	0
M00001500A:C05	5336	9	2	4	8	3	15
M00001500A:E11	2623	12	4	31	4	6	1
M00001500C:E04	9443	4	2	1	1	0	0
M00001501D:C02	9685	3	2	0	7	2	3
M00001504C:A07	10185	5	1	0	0	2	4
M00001504C:H06	6974	7	3	0	1	0	0
M00001504D:G06	6420	8	0	2	0	1	0
M00001507A:H05	39168	2	0	0	0	0	0
M00001511A:H06	39412	2	0	0	0	0	0
M00001512A:A09	39186	2	0	0	0	0	0
M00001512D:G09	3956	9	9	5	2	0	0
M00001513A:B06	4568	10	4	0	9	2	0
M00001513C:E08	14364	1	0	0	0	0	0
M00001514C:D11	40044	2	0	0	0	0	0
M00001517A:B07	4313	13	6	1	0	1	0
M00001518C:B11	8952	3	4	0	4	2	0
M00001528A:C04	7337	4	4	3	16	12	21
M00001528A:F09	18957	3	0	0	0	0	0
M00001528B:H04	8358	3	3	2	0	0	0
M00001531A:D01	38085	2	0	0	0	0	0
M00001532B:A06	3990	6	12	4	1	3	1
M00001533A:C11	2428	14	14	13	9	2	19
M00001534A:C04	16921	4	0	0	1	2	1
M00001534A:D09	5097	6	5	1	1	3	2
M00001534A:F09	5321	11	7	1	5	10	26

Table 5 All Differential Data for Libs 1-4 and 8-9

Clone Name	Cluster ID	Clones in Lib1	Clones in Lib2	Clones in Lib3	Clones in Lib4	Clones in Lib8	Clones in Lib9
M00001534C:A01	4119	9	4	2	2	5	3
M00001535A:B01	7665	3	1	5	0	0	0
M00001535A:C06	20212	2	0	1	1	0	0
M00001535A:F10	39423	2	0	0	0	0	0
M00001536A:B07	2696	23	11	9	18	10	21
M00001536A:C08	39392	2	0	0	0	0	0
M00001537A:F12	39420	2	0	0	0	0	0
M00001537B:G07	3389	4	11	13	2	0	0
M00001540A:D06	8286	6	1	0	3	4	0
M00001541A:D02	3765	19	6	0	0	0	0
M00001541A:F07	22085	3	0	0	0	0	1
M00001541A:H03	39174	2	0	0	0	0	0
M00001542A:A09	22113	3	0	0	0	0	0
M00001542A:E06	39453	2	0	0	0	0	0
M00001544A:E03	12170	2	1	2	0	0	0
M00001544A:G02	19829	2	0	1	0	0	0
M00001544B:B07	6974	7	3	0	1	0	0
M00001545A:C03	19255	2	0	0	0	0	0
M00001545A:D08	13864	3	0	2	1	2	4
M00001546A:G11	1267	43	55	5	0	0	0
M00001548A:E10	5892	5	1	4	4	1	3
M00001548A:H09	1058	40	44	37	47	39	59
M00001549A:B02	4015	10	5	8	15	2	0
M00001549A:D08	10944	3	0	3	1	0	7
M00001549B:F06	4193	12	7	2	2	0	1
M00001549C:E06	16347	4	0	0	0	0	0
M00001550A:A03	7239	5	2	1	0	2	0
M00001550A:G01	5175	8	1	3	2	0	0
M00001551A:B10	6268	6	4	3	18	5	0
M00001551A:F05	39180	2	0	0	0	0	0
M00001551A:G06	22390	2	1	0	0	0	1
M00001551C:G09	3266	12	14	0	1	0	6
M00001552A:B12	307	73	60	196	75	79	27
M00001552A:D11	39458	2	0	0	0	0	0
M00001552B:D04	5708	5	4	4	3	1	4
M00001553A:H06	8298	4	3	1	3	0	0
M00001553B:F12	4573	5	7	2	5	0	1
M00001553D:D10	22814	3	0	0	0	0	0
M00001555A:B02	39539	2	0	0	0	1	0
M00001555A:C01	39195	2	0	0	0	0	0
M00001555D:G10	4561	8	4	4	8	0	0
M00001556A:C09	9244	2	0	3	2	10	17
M00001556A:F11	1577	12	40	25	3	4	0
M00001556A:H01	15855	2	1	1	2	12	213
M00001556B:C08	4386	7	8	3	1	3	21
M00001556B:G02	11294	4	0	2	0	0	1
M00001557A:D02	7065	5	3	2	1	0	0
M00001557A:D02	7065	5	3	2	1	0	0

Table 5 All Differential Data for Libs 1-4 and 8-9

Clone Name	Cluster ID	Clones in Lib1	Clones in Lib2	Clones in Lib3	Clones in Lib4	Clones in Lib8	Clones in Lib9
M00001557A:F01	9635	3	0	2	1	0	0
M00001557A:F03	39490	2	0	0	0	1	0
M00001557B:H10	5192	8	5	0	5	0	0
M00001557D:D09	8761	3	4	0	1	0	1
M00001558B:H11	7514	5	3	0	0	0	0
M00001560D:F10	6558	4	3	4	0	0	5
M00001561A:C05	39486	2	0	0	0	0	0
M00001563B:F06	102	289	233	278	116	123	184
M00001564A:B12	5053	11	4	2	2	1	1
M00001571C:H06	5749	4	1	9	0	0	0
M00001578B:E04	23001	2	1	0	2	0	0
M00001579D:C03	6539	8	3	0	0	0	1
M00001583D:A10	6293	3	5	2	6	0	0
M00001586C:C05	4623	3	4	12	2	1	1
M00001587A:B11	39380	2	0	0	0	0	0
M00001594B:H04	260	189	188	27	2	15	0
M00001597C:H02	4837	6	2	10	0	3	1
M00001597D:C05	10470	5	1	0	2	0	1
M00001598A:G03	16999	4	0	0	0	0	0
M00001601A:D08	22794	2	0	0	0	0	0
M00001604A:B10	1399	49	27	19	7	10	23
M00001604A:F05	39391	2	0	0	0	0	0
M00001607A:E11	11465	5	0	0	0	0	0
M00001608A:B03	7802	5	4	0	1	0	0
M00001608B:E03	22155	3	0	0	0	0	0
M00001614C:F10	13157	4	1	0	3	1	0
M00001617C:E02	17004	4	0	1	0	1	0
M00001619C:F12	40314	2	0	0	0	1	0
M00001621C:C08	40044	2	0	0	0	0	0
M00001623D:F10	13913	2	1	2	0	0	1
M00001624A:B06	3277	10	11	8	3	5	1
M00001624C:F01	4309	4	13	3	10	0	0
M00001630B:H09	5214	10	2	2	2	4	3
M00001644C:B07	39171	2	0	0	0	0	0
M00001645A:C12	19267	2	0	0	0	0	1
M00001648C:A01	4665	5	9	0	0	0	0
M00001657D:C03	23201	3	0	0	0	3	0
M00001657D:F08	76760	1	0	2	2	0	5
M00001662C:A09	23218	3	0	0	0	0	0
M00001663A:E04	35702	2	0	0	0	0	0
M00001669B:F02	6468	4	3	3	8	1	0
M00001670C:H02	14367	3	0	0	0	0	0
M00001673C:H02	7015	6	3	1	2	1	1
M00001675A:C09	8773	4	1	4	4	4	6
M00001676B:F05	11460	4	2	0	0	0	0
M00001677C:E10	14627	1	2	1	0	1	0
M00001677D:A07	7570	5	3	0	0	0	0
M00001678D:F12	4416	9	5	2	6	1	3

Table 5 All Differential Data for Libs 1-4 and 8-9

Clone Name	Cluster ID	Clones in Lib1	Clones in Lib2	Clones in Lib3	Clones in Lib4	Clones in Lib8	Clones in Lib9
M00001679A:A06	6660	7	0	4	2	1	0
M00001679A:F10	26875	1	0	0	0	1	0
M00001679B:F01	6298	2	4	5	3	1	0
M00001679C:F01	78091	1	0	0	0	0	0
M00001679D:D03	10751	3	2	0	1	0	1
M00001679D:D03	10751	3	2	0	1	0	1
M00001680D:F08	10539	2	1	1	0	1	0
M00001682C:B12	17055	4	0	0	0	0	0
M00001686A:E06	4622	7	6	4	2	3	0
M00001688C:F09	5382	6	2	6	2	0	3
M00001693C:G01	4393	10	6	2	4	1	1
M00001716D:H05	67252	1	0	0	1	0	0
M00003741D:C09	40108	2	0	0	0	0	0
M00003747D:C05	11476	6	0	0	0	0	0
M00003759B:B09	697	76	52	30	72	21	30
M00003762C:B08	17076	4	0	0	0	0	0
M00003763A:F06	3108	14	11	7	5	0	1
M00003774C:A03	67907	1	0	0	0	0	0
M00003796C:D05	5619	3	5	3	3	0	4
M00003826B:A06	11350	3	3	0	0	1	0
M00003833A:E05	21877	2	1	0	0	0	1
M00003837D:A01	7899	5	4	0	2	1	0
M00003839A:D08	7798	5	2	2	0	0	1
M00003844C:B11	6539	8	3	0	0	0	1
M00003846B:D06	6874	6	3	0	0	0	0
M00003851B:D10	13595	4	0	1	0	0	1
M00003853A:D04	5619	3	5	3	3	0	4
M00003853A:F12	10515	5	1	0	1	1	2
M00003856B:C02	4622	7	6	4	2	3	0
M00003857A:G10	3389	4	11	13	2	0	0
M00003857A:H03	4718	4	5	5	2	4	6
M00003871C:E02	4573	5	7	2	5	0	1
M00003875B:F04	12977	5	0	0	0	0	0
M00003875B:F04	12977	5	0	0	0	0	0
M00003875C:G07	8479	4	3	1	1	2	4
M00003876D:E12	7798	5	2	2	0	0	1
M00003879B:C11	5345	7	1	7	4	6	27
M00003879B:D10	31587	1	1	0	0	1	0
M00003879D:A02	14507	3	1	0	0	3	1
M00003885C:A02	13576	5	0	0	0	12	11
M00003885C:A02	13576	5	0	0	0	12	11
M00003906C:E10	9285	4	3	0	0	1	2
M00003907D:A09	39809	1	0	0	0	2	1
M00003907D:H04	16317	3	0	0	0	0	0
M00003909D:C03	8672	4	4	0	0	0	0
M00003912B:D01	12532	4	1	0	1	0	1
M00003914C:F05	3900	9	6	8	1	7	13
M00003922A:E06	23255	3	0	1	1	0	0

Table 5 All Differential Data for Libs 1-4 and 8-9

Clone Name	Cluster ID	Clones in Lib1	Clones in Lib2	Clones in Lib3	Clones in Lib4	Clones in Lib8	Clones in Lib9
M00003958A:H02	18957	3	0	0	0	0	0
M00003958A:H02	18957	3	0	0	0	0	0
M00003958C:G10	40455	2	0	0	0	0	0
M00003958C:G10	40455	2	0	0	0	0	0
M00003968B:F06	24488	2	0	1	4	0	0
M00003970C:B09	40122	2	0	0	0	0	0
M00003974D:E07	23210	3	0	0	0	0	0
M00003974D:H02	23358	3	0	0	0	1	0
M00003975A:G11	12439	4	0	0	0	0	0
M00003978B:G05	5693	7	4	1	3	1	1
M00003981A:E10	3430	9	10	7	3	0	0
M00003982C:C02	2433	10	13	21	18	8	8
M00003983A:A05	9105	5	1	1	1	0	0
M00004028D:A06	6124	4	8	1	9	1	0
M00004028D:C05	40073	2	0	1	0	0	1
M00004031A:A12	9061	5	2	0	0	0	0
M00004031A:A12	9061	5	2	0	0	0	0
M00004035C:A07	37285	2	0	0	1	0	1
M00004035D:B06	17036	4	0	0	0	0	0
M00004059A:D06	5417	10	4	0	9	2	0
M00004068B:A01	3706	7	14	4	22	1	0
M00004072B:B05	17036	4	0	0	0	0	0
M00004081C:D10	15069	3	0	0	1	0	0
M00004081C:D12	14391	3	1	0	0	0	0
M00004086D:G06	9285	4	3	0	0	1	2
M00004087D:A01	6880	2	6	1	1	0	0
M00004093D:B12	5325	5	5	2	0	2	1
M00004093D:B12	5325	5	5	2	0	2	1
M00004105C:A04	7221	5	2	2	2	0	0
M00004108A:E06	4937	4	9	3	1	3	1
M00004111D:A08	6874	6	3	0	0	0	0
M00004114C:F11	13183	2	3	0	7	0	1
M00004138B:H02	13272	3	2	0	3	0	0
M00004146C:C11	5257	2	8	5	5	5	25
M00004151D:B08	16977	4	0	0	0	0	0
M00004157C:A09	6455	3	1	6	0	0	0
M00004169C:C12	5319	6	2	8	2	2	3
M00004171D:B03	4908	6	7	2	2	2	0
M00004172C:D08	11494	4	0	0	0	0	0
M00004183C:D07	16392	3	0	0	0	0	0
M00004185C:C03	11443	5	1	0	0	0	0
M00004197D:H01	8210	2	6	0	0	0	0
M00004203B:C12	14311	4	0	0	0	1	2
M00004212B:C07	2379	26	13	4	2	2	3
M00004214C:H05	11451	3	2	1	2	1	1
M00004223A:G10	16918	4	0	0	0	0	0
M00004223B:D09	7899	5	4	0	2	1	0
M00004223D:E04	12971	4	0	0	0	1	0

Table 5 All Differential Data for Libs 1-4 and 8-9

Clone Name	Cluster ID	Clones in Lib1	Clones in Lib2	Clones in Lib3	Clones in Lib4	Clones in Lib8	Clones in Lib9
M00004229B:F08	6455	3	1	6	0	0	0
M00004230B:C07	7212	3	5	2	1	3	0
M00004269D:D06	4905	7	6	3	1	3	1
M00004275C:C11	16914	3	0	0	1	0	0
M00004283B:A04	14286	3	1	0	1	1	1
M00004285B:E08	56020	1	0	0	0	0	0
M00004295D:F12	16921	4	0	0	1	2	1
M00004296C:H07	13046	4	1	0	1	0	0
M00004307C:A06	9457	2	0	5	0	3	0
M00004312A:G03	26295	2	0	0	0	0	0
M00004318C:D10	21847	2	1	0	0	0	0
M00004372A:A03	2030	13	10	32	4	0	0
M00004377C:F05	2102	12	20	23	21	6	5

Table 6 All Differential Data for Libs 15-20

Clone Name	Cluster ID	Clones in Lib15	Clones in Lib16b	Clones in Lib17	Clones in Lib18	Clones in Lib19	Clones in Lib20
M00001340B:A06	17062	0	0	0	0	0	0
M00001340D:F10	11589	0	0	0	0	0	0
M00001341A:E12	4443	0	0	0	1	0	0
M00001342B:E06	39805	0	0	0	0	0	0
M00001343C:F10	2790	0	0	0	0	0	0
M00001343D:H07	23255	0	0	0	0	0	0
M00001345A:E01	6420	0	0	0	0	0	0
M00001346A:F09	5007	0	0	0	0	0	0
M00001346D:E03	6806	0	0	0	0	0	0
M00001346D:G06	5779	0	0	0	0	0	0
M00001346D:G06	5779	0	0	0	0	0	0
M00001347A:B10	13576	0	0	0	0	0	0
M00001348B:B04	16927	0	0	0	0	0	0
M00001348B:G06	16985	0	0	0	0	0	0
M00001349B:B08	3584	0	0	0	0	0	0
M00001350A:H01	7187	0	0	0	0	0	0
M00001351B:A08	3162	0	1	0	0	1	0
M00001351B:A08	3162	0	1	0	0	1	0
M00001352A:E02	16245	0	0	0	0	0	0
M00001353A:G12	8078	0	0	0	0	0	0
M00001353D:D10	14929	0	3	1	0	5	0
M00001355B:G10	14391	0	0	0	0	0	0
M00001357D:D11	4059	0	0	0	0	0	0
M00001361A:A05	4141	0	0	0	0	0	0
M00001361D:F08	2379	0	0	0	0	0	0
M00001362B:D10	5622	0	0	0	0	0	0
M00001362C:H11	945	0	0	0	0	0	1
M00001365C:C10	40132	0	0	0	0	0	0
M00001370A:C09	6867	0	0	0	0	0	0
M00001371C:E09	7172	0	0	0	0	0	0
M00001376B:G06	17732	0	0	0	0	0	1
M00001378B:B02	39833	0	0	0	0	0	0
M00001379A:A05	1334	0	0	0	0	0	1
M00001380D:B09	39886	0	0	0	0	0	0
M00001382C:A02	22979	0	0	0	0	0	0
M00001383A:C03	39648	0	0	0	0	0	0
M00001383A:C03	39648	0	0	0	0	0	0
M00001386C:B12	5178	0	0	0	0	0	0
M00001387A:C05	2464	0	0	0	0	0	0
M00001387B:G03	7587	0	0	0	0	0	0
M00001388D:G05	5832	0	0	0	0	0	0
M00001389A:C08	16269	0	1	0	0	0	0
M00001394A:F01	6583	1	4	1	0	0	0
M00001395A:C03	4016	0	0	0	0	0	0
M00001396A:C03	4009	0	0	0	0	0	0
M00001402A:E08	39563	0	0	0	0	0	0
M00001407B:D11	5556	0	0	0	0	0	0
M00001409C:D12	9577	0	0	0	0	0	0

Table 6 All Differential Data for Libs 15-20

Clone Name	Cluster ID	Clones in Lib15	Clones in Lib16b	Clones in Lib17	Clones in Lib18	Clones in Lib19	Clones in Lib20
M00001410A:D07	7005	0	0	0	0	0	0
M00001412B:B10	8551	0	0	0	0	0	0
M00001415A:H06	13538	0	0	0	0	0	0
M00001416A:H01	7674	0	0	0	0	0	0
M00001416B:H11	8847	0	0	0	0	0	0
M00001417A:E02	36393	0	0	0	0	0	0
M00001418B:F03	9952	0	0	0	0	0	0
M00001418D:B06	8526	0	0	0	0	0	0
M00001421C:F01	9577	0	0	0	0	0	0
M00001423B:E07	15066	0	0	0	0	0	0
M00001424B:G09	10470	0	0	0	0	0	0
M00001425B:H08	22195	0	0	0	0	0	0
M00001426D:C08	4261	0	0	1	0	0	1
M00001428A:H10	84182	0	0	0	0	0	0
M00001429A:H04	2797	0	0	0	0	0	0
M00001429B:A11	4635	0	0	0	0	0	0
M00001429D:D07	40392	0	0	0	0	0	0
M00001439C:F08	40054	0	0	0	0	0	0
M00001442C:D07	16731	0	0	0	0	0	0
M00001445A:F05	13532	0	0	0	0	0	0
M00001446A:F05	7801	0	0	0	0	0	0
M00001447A:G03	10717	0	0	0	0	0	0
M00001448D:C09	8	1	6	6	1	14	1
M00001448D:H01	36313	0	3	0	0	3	0
M00001449A:A12	5857	0	0	0	0	0	0
M00001449A:B12	41633	0	0	0	0	0	0
M00001449A:D12	3681	0	0	0	0	0	0
M00001449A:G10	36535	0	0	0	0	0	0
M00001449C:D06	86110	0	0	0	0	0	0
M00001450A:A02	39304	0	0	0	0	0	0
M00001450A:A11	32663	0	0	0	0	0	0
M00001450A:B12	82498	0	0	0	0	0	0
M00001450A:D08	27250	0	0	0	0	0	0
M00001452A:B04	84328	0	0	0	0	0	0
M00001452A:B12	86859	0	0	0	0	0	0
M00001452A:D08	1120	0	0	0	0	0	0
M00001452A:F05	85064	0	0	0	0	0	0
M00001452C:B06	16970	0	0	2	0	1	0
M00001453A:E11	16130	0	0	0	0	0	0
M00001453C:F06	16653	0	0	0	0	0	0
M00001454A:A09	83103	0	0	0	0	0	0
M00001454B:C12	7005	0	0	0	0	0	0
M00001454D:G03	689	0	2	2	0	4	2
M00001455A:E09	13238	0	0	0	0	0	0
M00001455B:E12	13072	0	0	0	0	0	0
M00001455D:F09	9283	0	0	0	0	0	0
M00001455D:F09	9283	0	0	0	0	0	0
M00001460A:F06	2448	0	0	0	0	0	0
M00001460A:F12	39498	0	0	0	0	0	0

Table 6 All Differential Data for Libs 15-20

Clone Name	Cluster ID	Clones in Lib15	Clones in Lib16b	Clones in Lib17	Clones in Lib18	Clones in Lib19	Clones in Lib20
M00001461A:D06	1531	0	0	0	0	0	0
M00001463C:B11	19	2	13	13	0	69	10
M00001465A:B11	10145	0	0	0	0	0	0
M00001466A:E07	4275	0	0	0	0	0	0
M00001467A:B07	38759	0	0	0	0	0	0
M00001467A:D04	39508	0	0	0	0	0	0
M00001467A:D08	16283	0	0	0	0	0	0
M00001467A:D08	16283	0	0	0	0	0	0
M00001467A:E10	39442	0	0	0	0	0	0
M00001468A:F05	7589	0	0	0	0	0	0
M00001469A:C10	12081	0	0	0	0	0	0
M00001469A:H12	19105	0	0	0	0	0	0
M00001470A:B10	1037	0	0	0	0	0	0
M00001470A:C04	39425	0	0	0	0	0	0
M00001471A:B01	39478	0	0	0	0	0	0
M00001481D:A05	7985	0	0	0	0	0	0
M00001490B:C04	18699	0	0	0	0	0	0
M00001494D:F06	7206	0	0	0	0	0	0
M00001497A:G02	2623	0	0	0	0	0	0
M00001499B:A11	10539	0	0	0	0	0	0
M00001500A:C05	5336	0	0	0	0	0	0
M00001500A:E11	2623	0	0	0	0	0	0
M00001500C:E04	9443	0	0	0	0	0	0
M00001501D:C02	9685	0	0	0	0	0	0
M00001504C:A07	10185	0	0	0	0	0	0
M00001504C:H06	6974	0	0	0	0	0	0
M00001504D:G06	6420	0	0	0	0	0	0
M00001507A:H05	39168	0	0	0	0	0	0
M00001511A:H06	39412	0	0	0	0	0	0
M00001512A:A09	39186	0	0	0	0	0	0
M00001512D:G09	3956	0	0	1	0	0	0
M00001513A:B06	4568	0	0	0	0	0	0
M00001513C:E08	14364	0	0	0	0	0	0
M00001514C:D11	40044	0	1	0	0	0	0
M00001517A:B07	4313	0	0	0	0	0	0
M00001518C:B11	8952	0	0	0	0	0	0
M00001528A:C04	7337	0	0	0	0	0	0
M00001528A:F09	18957	0	0	0	0	0	0
M00001528B:H04	8358	0	0	0	0	0	0
M00001531A:D01	38085	0	0	0	0	0	0
M00001532B:A06	3990	1	1	0	0	0	0
M00001533A:C11	2428	0	0	1	0	0	0
M00001534A:C04	16921	0	0	0	0	0	0
M00001534A:D09	5097	0	0	0	0	0	0
M00001534A:F09	5321	0	1	0	0	2	0
M00001534C:A01	4119	0	0	0	0	0	0
M00001535A:B01	7665	0	0	0	0	0	0
M00001535A:C06	20212	0	0	0	0	0	0
M00001535A:F10	39423	0	0	0	0	0	0

Table 6 All Differential Data for Libs 15-20

Clone Name	Cluster ID	Clones in Lib15	Clones in Lib16b	Clones in Lib17	Clones in Lib18	Clones in Lib19	Clones in Lib20
M00001536A:B07	2696	0	0	0	0	3	0
M00001536A:C08	39392	0	0	0	0	0	0
M00001537A:F12	39420	0	0	0	0	0	0
M00001537B:G07	3389	0	0	0	0	0	0
M00001540A:D06	8286	0	0	0	0	0	0
M00001541A:D02	3765	0	0	0	0	0	0
M00001541A:F07	22085	0	0	0	0	0	0
M00001541A:H03	39174	0	0	0	0	0	0
M00001542A:A09	22113	0	0	0	0	0	0
M00001542A:E06	39453	0	0	0	0	0	0
M00001544A:E03	12170	0	0	0	0	0	0
M00001544A:G02	19829	0	0	0	0	0	0
M00001544B:B07	6974	0	0	0	0	0	0
M00001545A:C03	19255	0	0	0	0	0	0
M00001545A:D08	13864	0	0	0	0	0	0
M00001546A:G11	1267	1	0	0	0	7	0
M00001548A:E10	5892	0	0	0	0	0	0
M00001548A:H09	1058	0	0	1	0	0	0
M00001549A:B02	4015	0	0	0	0	0	0
M00001549A:D08	10944	0	0	0	0	0	0
M00001549B:F06	4193	0	0	0	0	0	0
M00001549C:E06	16347	0	0	0	0	0	0
M00001550A:A03	7239	0	0	0	0	0	0
M00001550A:G01	5175	0	0	0	0	0	0
M00001551A:B10	6268	0	0	0	0	0	0
M00001551A:F05	39180	0	0	0	0	0	0
M00001551A:G06	22390	0	0	0	0	0	0
M00001551C:G09	3266	0	0	1	0	0	0
M00001552A:B12	307	0	0	0	0	3	0
M00001552A:D11	39458	0	0	0	0	0	0
M00001552B:D04	5708	0	1	0	0	0	0
M00001553A:H06	8298	0	0	0	0	0	0
M00001553B:F12	4573	0	0	0	0	0	0
M00001553D:D10	22814	0	0	0	0	0	0
M00001555A:B02	39539	0	0	0	0	0	0
M00001555A:C01	39195	0	0	0	0	0	0
M00001555D:G10	4561	0	0	0	0	0	0
M00001556A:C09	9244	0	0	0	0	0	0
M00001556A:F11	1577	0	0	0	0	0	0
M00001556A:H01	15855	3	5	5	0	3	1
M00001556B:C08	4386	1	2	0	0	0	0
M00001556B:G02	11294	0	0	0	0	0	0
M00001557A:D02	7065	0	0	0	0	0	0
M00001557A:D02	7065	0	0	0	0	0	0
M00001557A:F01	9635	0	0	0	0	0	0
M00001557A:F03	39490	0	0	0	0	0	0
M00001557B:H10	5192	0	0	0	0	0	0
M00001557D:D09	8761	0	0	0	0	0	0
M00001558B:H11	7514	0	0	0	0	0	0

Table 6 All Differential Data for Libs 15-20

Clone Name	Cluster ID	Clones in Lib15	Clones in Lib16b	Clones in Lib17	Clones in Lib18	Clones in Lib19	Clones in Lib20
M00001560D:F10	6558	0	0	0	0	0	0
M00001561A:C05	39486	0	0	0	0	0	0
M00001563B:F06	102	22	38	65	7	43	10
M00001564A:B12	5053	0	0	1	0	0	0
M00001571C:H06	5749	0	0	0	0	0	0
M00001578B:E04	23001	0	0	0	0	0	0
M00001579D:C03	6539	0	0	0	0	0	0
M00001583D:A10	6293	0	0	0	0	0	0
M00001586C:C05	4623	0	0	0	0	1	0
M00001587A:B11	39380	0	0	0	0	0	0
M00001594B:H04	260	0	0	0	0	1	0
M00001597C:H02	4837	0	0	0	0	0	0
M00001597D:C05	10470	0	0	0	0	0	0
M00001598A:G03	16999	1	1	1	0	0	0
M00001601A:D08	22794	0	0	0	0	0	0
M00001604A:B10	1399	0	0	0	0	0	0
M00001604A:F05	39391	0	0	0	0	0	0
M00001607A:E11	11465	0	0	0	0	0	0
M00001608A:B03	7802	0	0	0	0	0	0
M00001608B:E03	22155	0	0	0	0	0	0
M00001614C:F10	13157	0	0	0	0	0	0
M00001617C:E02	17004	0	0	0	0	1	0
M00001619C:F12	40314	0	0	0	0	0	0
M00001621C:C08	40044	0	1	0	0	0	0
M00001623D:F10	13913	0	0	0	0	0	0
M00001624A:B06	3277	0	0	0	0	0	0
M00001624C:F01	4309	0	0	0	0	0	0
M00001630B:H09	5214	1	0	0	1	1	0
M00001644C:B07	39171	0	0	0	0	0	0
M00001645A:C12	19267	0	0	0	0	1	0
M00001648C:A01	4665	0	0	0	0	0	0
M00001657D:C03	23201	0	0	0	0	0	0
M00001657D:F08	76760	0	0	0	0	0	0
M00001662C:A09	23218	0	0	0	0	0	0
M00001663A:E04	35702	0	0	0	0	0	0
M00001669B:F02	6468	0	0	0	0	0	0
M00001670C:H02	14367	0	0	0	0	0	0
M00001673C:H02	7015	0	0	0	0	0	0
M00001675A:C09	8773	0	0	0	0	0	0
M00001676B:F05	11460	0	0	0	0	0	0
M00001677C:E10	14627	0	1	0	0	0	0
M00001677D:A07	7570	0	0	0	0	0	0
M00001678D:F12	4416	0	0	0	0	0	0
M00001679A:A06	6660	0	0	0	0	0	0
M00001679A:F10	26875	0	0	0	0	0	0
M00001679B:F01	6298	0	0	0	0	0	0
M00001679C:F01	78091	0	0	0	0	0	0
M00001679D:D03	10751	0	0	0	0	0	0
M00001679D:D03	10751	0	0	0	0	0	0

Table 6 All Differential Data for Libs 15-20

Clone Name	Cluster ID	Clones in Lib15	Clones in Lib16b	Clones in Lib17	Clones in Lib18	Clones in Lib19	Clones in Lib20
M00001680D:F08	10539	0	0	0	0	0	0
M00001682C:B12	17055	0	0	0	0	0	0
M00001686A:E06	4622	0	0	0	0	0	0
M00001688C:F09	5382	0	0	0	0	0	0
M00001693C:G01	4393	0	0	0	0	0	0
M00001716D:H05	67252	0	0	0	0	0	0
M00003741D:C09	40108	0	0	0	0	0	0
M00003747D:C05	11476	0	0	0	0	0	0
M00003759B:B09	697	0	0	0	0	1	0
M00003762C:B08	17076	0	0	0	0	0	0
M00003763A:F06	3108	0	0	0	0	0	0
M00003774C:A03	67907	0	0	0	0	0	0
M00003796C:D05	5619	0	0	0	0	0	0
M00003826B:A06	11350	0	0	0	0	0	0
M00003833A:E05	21877	0	0	0	0	0	0
M00003837D:A01	7899	0	0	0	0	0	0
M00003839A:D08	7798	0	0	0	0	0	0
M00003844C:B11	6539	0	0	0	0	0	0
M00003846B:D06	6874	0	0	1	0	0	0
M00003851B:D10	13595	0	0	0	0	0	0
M00003853A:D04	5619	0	0	0	0	0	0
M00003853A:F12	10515	0	0	0	0	0	0
M00003856B:C02	4622	0	0	0	0	0	0
M00003857A:G10	3389	0	0	0	0	0	0
M00003857A:H03	4718	0	0	0	0	0	0
M00003871C:E02	4573	0	0	0	0	0	0
M00003875B:F04	12977	0	0	0	0	0	0
M00003875B:F04	12977	0	0	0	0	0	0
M00003875C:G07	8479	0	0	0	0	0	1
M00003876D:E12	7798	0	0	0	0	0	0
M00003879B:C11	5345	0	0	0	2	0	1
M00003879B:D10	31587	0	0	0	0	0	0
M00003879D:A02	14507	0	0	0	0	0	0
M00003885C:A02	13576	0	0	0	0	0	0
M00003885C:A02	13576	0	0	0	0	0	0
M00003906C:E10	9285	0	0	0	0	0	0
M00003907D:A09	39809	0	0	0	0	0	0
M00003907D:H04	16317	0	0	0	0	0	0
M00003909D:C03	8672	0	0	0	0	0	0
M00003912B:D01	12532	0	0	0	0	0	0
M00003914C:F05	3900	0	0	0	0	1	0
M00003922A:E06	23255	0	0	0	0	0	0
M00003958A:H02	18957	0	0	0	0	0	0
M00003958A:H02	18957	0	0	0	0	0	0
M00003958C:G10	40455	0	0	0	0	0	0
M00003958C:G10	40455	0	0	0	0	0	0
M00003968B:F06	24488	0	0	0	0	0	0
M00003970C:B09	40122	0	0	0	0	0	0
M00003974D:E07	23210	0	0	0	0	0	0

Table 6 All Differential Data for Libs 15-20

Clone Name	Cluster ID	Clones in Lib15	Clones in Lib16b	Clones in Lib17	Clones in Lib18	Clones in Lib19	Clones in Lib20
M00003974D:H02	23358	0	0	0	0	0	0
M00003975A:G11	12439	0	0	0	0	0	0
M00003978B:G05	5693	0	0	0	0	0	0
M00003981A:E10	3430	0	0	0	0	1	0
M00003982C:C02	2433	0	0	0	0	0	0
M00003983A:A05	9105	0	0	0	0	0	0
M00004028D:A06	6124	0	0	0	0	0	0
M00004028D:C05	40073	0	0	0	0	0	0
M00004031A:A12	9061	0	0	0	0	0	0
M00004031A:A12	9061	0	0	0	0	0	0
M00004035C:A07	37285	0	0	0	0	0	0
M00004035D:B06	17036	0	0	0	0	0	0
M00004059A:D06	5417	0	0	0	0	0	0
M00004068B:A01	3706	0	0	0	0	0	0
M00004072B:B05	17036	0	0	0	0	0	0
M00004081C:D10	15069	0	0	0	0	0	0
M00004081C:D12	14391	0	0	0	0	0	0
M00004086D:G06	9285	0	0	0	0	0	0
M00004087D:A01	6880	0	0	0	0	0	0
M00004093D:B12	5325	1	1	0	1	0	1
M00004093D:B12	5325	1	1	0	1	0	1
M00004105C:A04	7221	0	0	0	0	0	0
M00004108A:E06	4937	0	0	0	0	0	0
M00004111D:A08	6874	0	0	1	0	0	0
M00004114C:F11	13183	0	0	0	0	0	0
M00004138B:H02	13272	0	0	0	0	0	0
M00004146C:C11	5257	0	1	0	0	0	0
M00004151D:B08	16977	0	0	0	0	0	0
M00004157C:A09	6455	0	0	0	0	0	0
M00004169C:C12	5319	0	0	0	0	0	0
M00004171D:B03	4908	0	0	0	0	0	0
M00004172C:D08	11494	0	0	0	0	0	0
M00004183C:D07	16392	0	0	0	0	0	0
M00004185C:C03	11443	0	0	0	0	0	0
M00004197D:H01	8210	0	0	0	0	0	0
M00004203B:C12	14311	0	0	0	0	0	0
M00004212B:C07	2379	0	0	0	0	0	0
M00004214C:H05	11451	0	0	0	0	0	0
M00004223A:G10	16918	0	0	0	0	0	0
M00004223B:D09	7899	0	0	0	0	0	0
M00004223D:E04	12971	0	0	0	0	0	0
M00004229B:F08	6455	0	0	0	0	0	0
M00004230B:C07	7212	0	0	0	0	0	0
M00004269D:D06	4905	0	0	0	0	0	0
M00004275C:C11	16914	0	0	0	0	0	0
M00004283B:A04	14286	0	0	0	0	0	0
M00004285B:E08	56020	0	0	0	0	0	0
M00004295D:F12	16921	0	0	0	0	0	0
M00004296C:H07	13046	0	0	0	0	0	0

Table 6 All Differential Data for Libs 15-20

Clone Name	Cluster ID	Clones in Lib15	Clones in Lib16b	Clones in Lib17	Clones in Lib18	Clones in Lib19	Clones in Lib20
M00004307C:A06	9457	0	0	0	0	0	0
M00004312A:G03	26295	0	0	0	0	0	0
M00004318C:D10	21847	0	0	0	0	0	0
M00004372A:A03	2030	0	0	0	0	0	0
M00004377C:F05	2102	0	0	0	0	0	0

Table 7 All Differential Data for Libs 12-14

Clone Name	Cluster ID	Clones in Lib12	Clones in Lib13	Clones in Lib14
M00001340B:A06	17062	0	0	0
M00001340D:F10	11589	0	0	0
M00001341A:E12	4443	4	2	0
M00001342B:E06	39805	0	0	0
M00001343C:F10	2790	0	0	0
M00001343D:H07	23255	0	0	0
M00001345A:E01	6420	0	0	0
M00001346A:F09	5007	0	0	0
M00001346D:E03	6806	0	1	1
M00001346D:G06	5779	0	0	0
M00001346D:G06	5779	0	0	0
M00001347A:B10	13576	0	0	0
M00001348B:B04	16927	0	0	0
M00001348B:G06	16985	0	0	0
M00001349B:B08	3584	0	0	0
M00001350A:H01	7187	0	0	0
M00001351B:A08	3162	0	0	1
M00001351B:A08	3162	0	0	1
M00001352A:E02	16245	0	0	0
M00001353A:G12	8078	0	0	0
M00001353D:D10	14929	0	1	0
M00001355B:G10	14391	0	0	0
M00001357D:D11	4059	0	0	0
M00001361A:A05	4141	1	2	1
M00001361D:F08	2379	0	0	0
M00001362B:D10	5622	0	2	1
M00001362C:H11	945	0	0	0
M00001365C:C10	40132	0	0	0
M00001370A:C09	6867	0	0	0
M00001371C:E09	7172	0	0	1
M00001376B:G06	17732	2	0	0
M00001378B:B02	39833	0	0	0
M00001379A:A05	1334	0	0	0
M00001380D:B09	39886	0	0	0
M00001382C:A02	22979	1	0	0
M00001383A:C03	39648	0	0	0
M00001383A:C03	39648	0	0	0
M00001386C:B12	5178	0	0	0
M00001387A:C05	2464	0	0	0
M00001387B:G03	7587	0	0	0
M00001388D:G05	5832	0	0	0
M00001389A:C08	16269	2	0	0
M00001394A:F01	6583	0	0	0
M00001395A:C03	4016	0	0	0
M00001396A:C03	4009	2	0	0
M00001402A:E08	39563	0	0	0
M00001407B:D11	5556	0	0	0

Table 7 All Differential Data for Libs 12-14

Clone Name	Cluster ID	Clones in Lib12	Clones in Lib13	Clones in Lib14
M00001409C:D12	9577	0	0	0
M00001410A:D07	7005	0	0	0
M00001412B:B10	8551	0	0	0
M00001415A:H06	13538	0	0	0
M00001416A:H01	7674	0	0	0
M00001416B:H11	8847	1	0	0
M00001417A:E02	36393	0	0	0
M00001418B:F03	9952	0	0	0
M00001418D:B06	8526	0	0	0
M00001421C:F01	9577	0	0	0
M00001423B:E07	15066	0	0	0
M00001424B:G09	10470	0	0	0
M00001425B:H08	22195	0	0	0
M00001426D:C08	4261	0	0	0
M00001428A:H10	84182	0	0	0
M00001429A:H04	2797	0	0	0
M00001429B:A11	4635	0	0	0
M00001429D:D07	40392	0	0	0
M00001439C:F08	40054	0	0	0
M00001442C:D07	16731	0	0	0
M00001445A:F05	13532	0	0	0
M00001446A:F05	7801	0	1	0
M00001447A:G03	10717	0	0	0
M00001448D:C09	8	7	6	9
M00001448D:H01	36313	1	0	0
M00001449A:A12	5857	0	0	0
M00001449A:B12	41633	0	0	0
M00001449A:D12	3681	1	0	0
M00001449A:G10	36535	0	0	0
M00001449C:D06	86110	0	0	0
M00001450A:A02	39304	0	1	0
M00001450A:A11	32663	0	0	0
M00001450A:B12	82498	0	0	0
M00001450A:D08	27250	0	0	0
M00001452A:B04	84328	0	0	0
M00001452A:B12	86859	0	0	0
M00001452A:D08	1120	0	0	0
M00001452A:F05	85064	0	0	0
M00001452C:B06	16970	1	0	0
M00001453A:E11	16130	0	0	0
M00001453C:F06	16653	0	0	0
M00001454A:A09	83103	0	0	0
M00001454B:C12	7005	0	0	0
M00001454D:G03	689	0	0	1
M00001455A:E09	13238	0	0	0
M00001455B:E12	13072	0	0	0
M00001455D:F09	9283	0	0	0
M00001455D:F09	9283	0	0	0

Table 7 All Differential Data for Libs 12-14

Clone Name	Cluster ID	Clones in Lib12	Clones in Lib13	Clones in Lib14
M00001460A:F06	2448	0	0	0
M00001460A:F12	39498	0	0	0
M00001461A:D06	1531	0	0	1
M00001463C:B11	19	17	32	31
M00001465A:B11	10145	0	0	0
M00001466A:E07	4275	0	0	0
M00001467A:B07	38759	0	0	0
M00001467A:D04	39508	0	0	0
M00001467A:D08	16283	0	0	0
M00001467A:D08	16283	0	0	0
M00001467A:E10	39442	0	0	0
M00001468A:F05	7589	0	0	0
M00001469A:C10	12081	0	0	0
M00001469A:H12	19105	0	0	0
M00001470A:B10	1037	0	0	0
M00001470A:C04	39425	0	0	0
M00001471A:B01	39478	0	0	0
M00001481D:A05	7985	0	0	0
M00001490B:C04	18699	0	0	0
M00001494D:F06	7206	0	0	0
M00001497A:G02	2623	1	0	0
M00001499B:A11	10539	0	1	0
M00001500A:C05	5336	0	0	0
M00001500A:E11	2623	1	0	0
M00001500C:E04	9443	0	0	0
M00001501D:C02	9685	0	0	0
M00001504C:A07	10185	0	0	0
M00001504C:H06	6974	0	0	0
M00001504D:G06	6420	0	0	0
M00001507A:H05	39168	0	0	0
M00001511A:H06	39412	0	0	0
M00001512A:A09	39186	0	0	0
M00001512D:G09	3956	0	0	0
M00001513A:B06	4568	0	0	0
M00001513C:E08	14364	0	0	0
M00001514C:D11	40044	0	0	0
M00001517A:B07	4313	0	0	0
M00001518C:B11	8952	0	0	0
M00001528A:C04	7337	1	2	2
M00001528A:F09	18957	0	0	0
M00001528B:H04	8358	0	0	0
M00001531A:D01	38085	0	0	0
M00001532B:A06	3990	0	0	0
M00001533A:C11	2428	0	0	0
M00001534A:C04	16921	0	0	0
M00001534A:D09	5097	0	0	0
M00001534A:F09	5321	4	7	6
M00001534C:A01	4119	0	0	0

Table 7 All Differential Data for Libs 12-14

Clone Name	Cluster ID	Clones in Lib12	Clones in Lib13	Clones in Lib14
M00001535A:B01	7665	0	2	4
M00001535A:C06	20212	0	0	0
M00001535A:F10	39423	0	0	0
M00001536A:B07	2696	0	0	0
M00001536A:C08	39392	0	0	0
M00001537A:F12	39420	0	0	0
M00001537B:G07	3389	0	0	0
M00001540A:D06	8286	0	0	0
M00001541A:D02	3765	0	0	0
M00001541A:F07	22085	0	0	0
M00001541A:H03	39174	0	0	0
M00001542A:A09	22113	0	0	0
M00001542A:E06	39453	0	0	0
M00001544A:E03	12170	0	0	0
M00001544A:G02	19829	0	0	0
M00001544B:B07	6974	0	0	0
M00001545A:C03	19255	0	0	0
M00001545A:D08	13864	0	0	0
M00001546A:G11	1267	0	0	0
M00001548A:E10	5892	0	1	0
M00001548A:H09	1058	1	3	0
M00001549A:B02	4015	0	1	0
M00001549A:D08	10944	1	0	0
M00001549B:F06	4193	0	0	0
M00001549C:E06	16347	0	0	0
M00001550A:A03	7239	0	1	0
M00001550A:G01	5175	1	0	0
M00001551A:B10	6268	0	0	1
M00001551A:F05	39180	0	0	0
M00001551A:G06	22390	0	0	1
M00001551C:G09	3266	0	0	0
M00001552A:B12	307	6	11	4
M00001552A:D11	39458	0	0	0
M00001552B:D04	5708	0	0	0
M00001553A:H06	8298	0	0	0
M00001553B:F12	4573	0	0	0
M00001553D:D10	22814	0	0	0
M00001555A:B02	39539	0	0	0
M00001555A:C01	39195	0	0	0
M00001555D:G10	4561	0	0	0
M00001556A:C09	9244	0	1	0
M00001556A:F11	1577	0	0	2
M00001556A:H01	15855	1	1	0
M00001556B:C08	4386	3	0	1
M00001556B:G02	11294	0	0	0
M00001557A:D02	7065	0	0	0
M00001557A:D02	7065	0	0	0
M00001557A:F01	9635	0	0	0

Table 7 All Differential Data for Libs 12-14

Clone Name	Cluster ID	Clones in Lib12	Clones in Lib13	Clones in Lib14
M00001557A:F03	39490	0	0	0
M00001557B:H10	5192	0	0	0
M00001557D:D09	8761	0	0	0
M00001558B:H11	7514	0	0	0
M00001560D:F10	6558	0	0	0
M00001561A:C05	39486	0	0	0
M00001563B:F06	102	2	1	2
M00001564A:B12	5053	0	0	0
M00001571C:H06	5749	0	0	0
M00001578B:E04	23001	0	0	0
M00001579D:C03	6539	0	0	0
M00001583D:A10	6293	0	0	0
M00001586C:C05	4623	0	0	0
M00001587A:B11	39380	0	0	0
M00001594B:H04	260	1	0	0
M00001597C:H02	4837	1	0	0
M00001597D:C05	10470	0	0	0
M00001598A:G03	16999	4	2	6
M00001601A:D08	22794	0	0	0
M00001604A:B10	1399	6	3	3
M00001604A:F05	39391	0	0	0
M00001607A:E11	11465	0	0	0
M00001608A:B03	7802	0	0	0
M00001608B:E03	22155	0	0	0
M00001614C:F10	13157	0	0	0
M00001617C:E02	17004	0	0	0
M00001619C:F12	40314	0	0	0
M00001621C:C08	40044	0	0	0
M00001623D:F10	13913	0	0	0
M00001624A:B06	3277	0	0	0
M00001624C:F01	4309	0	0	0
M00001630B:H09	5214	0	1	2
M00001644C:B07	39171	0	0	0
M00001645A:C12	19267	0	0	0
M00001648C:A01	4665	0	0	0
M00001657D:C03	23201	0	0	0
M00001657D:F08	76760	0	0	0
M00001662C:A09	23218	0	0	0
M00001663A:E04	35702	0	0	0
M00001669B:F02	6468	0	0	0
M00001670C:H02	14367	0	0	0
M00001673C:H02	7015	0	0	0
M00001675A:C09	8773	0	0	0
M00001676B:F05	11460	2	0	0
M00001677C:E10	14627	0	0	0
M00001677D:A07	7570	0	0	0
M00001678D:F12	4416	1	2	0
M00001679A:A06	6660	0	0	0

Table 7 All Differential Data for Libs 12-14

Clone Name	Cluster ID	Clones in Lib12	Clones in Lib13	Clones in Lib14
M00001679A:F10	26875	0	0	0
M00001679B:F01	6298	0	0	0
M00001679C:F01	78091	0	0	0
M00001679D:D03	10751	0	0	0
M00001679D:D03	10751	0	0	0
M00001680D:F08	10539	0	1	0
M00001682C:B12	17055	0	0	0
M00001686A:E06	4622	0	0	0
M00001688C:F09	5382	0	0	0
M00001693C:G01	4393	0	0	0
M00001716D:H05	67252	0	0	0
M00003741D:C09	40108	0	0	0
M00003747D:C05	11476	0	0	0
M00003759B:B09	697	0	0	0
M00003762C:B08	17076	0	0	0
M00003763A:F06	3108	0	0	0
M00003774C:A03	67907	0	0	0
M00003796C:D05	5619	0	1	0
M00003826B:A06	11350	0	0	0
M00003833A:E05	21877	0	0	0
M00003837D:A01	7899	0	0	0
M00003839A:D08	7798	0	0	0
M00003844C:B11	6539	0	0	0
M00003846B:D06	6874	0	0	0
M00003851B:D10	13595	0	0	0
M00003853A:D04	5619	0	1	0
M00003853A:F12	10515	0	0	1
M00003856B:C02	4622	0	0	0
M00003857A:G10	3389	0	0	0
M00003857A:H03	4718	0	0	0
M00003871C:E02	4573	0	0	0
M00003875B:F04	12977	0	0	0
M00003875B:F04	12977	0	0	0
M00003875C:G07	8479	1	0	0
M00003876D:E12	7798	0	0	0
M00003879B:C11	5345	4	8	3
M00003879B:D10	31587	0	0	0
M00003879D:A02	14507	0	0	0
M00003885C:A02	13576	0	0	0
M00003885C:A02	13576	0	0	0
M00003906C:E10	9285	0	0	0
M00003907D:A09	39809	0	0	0
M00003907D:H04	16317	0	0	0
M00003909D:C03	8672	0	0	0
M00003912B:D01	12532	0	0	0
M00003914C:F05	3900	0	1	0
M00003922A:E06	23255	0	0	0
M00003958A:H02	18957	0	0	0

Table 7 All Differential Data for Libs 12-14

Clone Name	Cluster ID	Clones in Lib12	Clones in Lib13	Clones in Lib14
M00003958A:H02	18957	0	0	0
M00003958C:G10	40455	0	0	0
M00003958C:G10	40455	0	0	0
M00003968B:F06	24488	0	0	0
M00003970C:B09	40122	0	0	0
M00003974D:E07	23210	0	0	0
M00003974D:H02	23358	0	0	0
M00003975A:G11	12439	0	0	0
M00003978B:G05	5693	0	0	0
M00003981A:E10	3430	0	0	0
M00003982C:C02	2433	2	4	0
M00003983A:A05	9105	0	0	0
M00004028D:A06	6124	0	0	0
M00004028D:C05	40073	0	1	0
M00004031A:A12	9061	0	0	0
M00004031A:A12	9061	0	0	0
M00004035C:A07	37285	0	0	0
M00004035D:B06	17036	0	0	0
M00004059A:D06	5417	0	0	0
M00004068B:A01	3706	0	0	0
M00004072B:B05	17036	0	0	0
M00004081C:D10	15069	0	0	0
M00004081C:D12	14391	0	0	0
M00004086D:G06	9285	0	0	0
M00004087D:A01	6880	0	0	0
M00004093D:B12	5325	0	0	0
M00004093D:B12	5325	0	0	0
M00004105C:A04	7221	0	0	0
M00004108A:E06	4937	0	0	0
M00004111D:A08	6874	0	0	0
M00004114C:F11	13183	0	0	0
M00004138B:H02	13272	0	0	0
M00004146C:C11	5257	0	0	1
M00004151D:B08	16977	0	0	0
M00004157C:A09	6455	0	0	0
M00004169C:C12	5319	0	0	0
M00004171D:B03	4908	0	0	0
M00004172C:D08	11494	0	0	0
M00004183C:D07	16392	0	0	0
M00004185C:C03	11443	2	0	0
M00004197D:H01	8210	0	0	0
M00004203B:C12	14311	0	0	0
M00004212B:C07	2379	0	0	0
M00004214C:H05	11451	0	0	0
M00004223A:G10	16918	0	0	0
M00004223B:D09	7899	0	0	0
M00004223D:E04	12971	0	0	0
M00004229B:F08	6455	0	0	0

Table 7 All Differential Data for Libs 12-14

Clone Name	Cluster ID	Clones in Lib12	Clones in Lib13	Clones in Lib14
M00004230B:C07	7212	0	0	1
M00004269D:D06	4905	0	0	0
M00004275C:C11	16914	0	0	0
M00004283B:A04	14286	0	0	0
M00004285B:E08	56020	0	0	0
M00004295D:F12	16921	0	0	0
M00004296C:H07	13046	0	0	0
M00004307C:A06	9457	1	0	0
M00004312A:G03	26295	0	0	0
M00004318C:D10	21847	0	0	0
M00004372A:A03	2030	0	0	0
M00004377C:F05	2102	0	0	0

We Claim:

1. A library of polynucleotides, the library comprising the sequence information of at least one of SEQ ID NOS:1-844.

5

2. The library of claim 1, wherein the library is provided on a nucleic acid array.

3. The library of claim 1, wherein the library is provided in a computer-readable format.

10

4. The library of claim 1, wherein the library comprises a differentially expressed polynucleotide comprising a sequence selected from the group consisting of SEQ ID NOS:9, 39, 42, 52, 62, 74, 119, 172, 317, and 379.

15

5. The library of claim 1, wherein the library comprises a polynucleotide differentially expressed in a human breast cancer cell, where the polynucleotide comprises a sequence selected from the group consisting of SEQ ID NOS: 4, 9, 39, 42, 52, 62, 65, 66, 68, 74, 81, 114, 123, 144, 130, 157, 162, 172, 178, 183, 202, 214, 219, 223, 258, 298, 317, 338, 379, 384, 386, and 388.

20

6. The library of claim 1, wherein the library comprises a polynucleotide differentially expressed in a human colon cancer cell, where the polynucleotide comprises a sequence selected from the group consisting of SEQ ID NOS: 1, 39, 52, 97, 119, 134, 172, 176, 241, 288, 317, 357, 362, and 374.

25

7. The library of claim 1, wherein the library comprises a polynucleotide differentially expressed in a human lung cancer cell, where the polynucleotide comprises a sequence selected from the group consisting of SEQ ID NOS: 9, 34, 42, 62, 74, 106, 119, 135, 154, 160, 260, 308, 323, 349, 361, 369, 371, 379, 395, 381, and 400.

30

8. An isolated polynucleotide comprising a nucleotide sequence having at least 90% sequence identity to an identifying sequence of SEQ ID NOS:1-844 or a degenerate variant thereof.

9. An isolated polynucleotide according to claim 8, wherein the polynucleotide comprises a sequence encoding a polypeptide of a protein family selected from the group consisting of: 4 transmembrane segments integral membrane proteins, 7 transmembrane
5 receptors, ATPases associated with various cellular activities (AAA), eukaryotic aspartyl proteases, GATA family of transcription factors, G-protein alpha subunit, phorbol esters/diacylglycerol binding proteins, protein kinase, protein phosphatase 2C, protein tyrosine phosphatase, trypsin, wnt family of developmental signaling proteins, and WW/rsp5/WWP domain containing proteins.

10. The polynucleotide of claim 9, wherein the polynucleotide comprises a sequence of one of SEQ ID NOS: 24, 41, 101, 157, 291, 305, 315, 341, 63, 116, 134, 136, 151, 384, 404, 308, 213, 367, 188, 251, 202, 315, 367, 397, 256, 382, 169, 23, 291, 324, 330, 341, 353, 188, 379, and 395.

11. The polynucleotide of claim 8, wherein the polynucleotide comprises a sequence encoding a polypeptide having a functional domain selected from the group consisting of: Ank repeat, basic region plus leucine zipper transcription factors, bromodomain, EF-hand, SH3 domain, WD domain/G-beta repeats, zinc finger (C2H2 type),
20 zinc finger (CCHC class), and zinc-binding metalloprotease domain.

12. The polynucleotide of claim 11, wherein the polynucleotide comprises a sequence of one of SEQ ID NOS: 116, 251, 374, 97, 136, 242, 379, 306, 386, 18, 335, 61, 306, 386, 322, 306, and 395.

13. A recombinant host cell containing the polynucleotide of claim 8.

14. An isolated polypeptide encoded by the polynucleotide of claim 8.

15. An antibody that specifically binds a polypeptide of claim 14.

16. A vector comprising the polynucleotide of claim 8.

17. A polynucleotide comprising the nucleotide sequence of an insert contained in a clone deposited as ATCC accession number xx, xx, xx, xx, xx, xx, xx, xx, or xx.

18. A method of detecting differentially expressed genes correlated with a cancerous
5 state of a mammalian cell, the method comprising the step of:

detecting at least one differentially expressed gene product in a test sample derived from a cell suspected of being cancerous, where the gene product is encoded by a gene corresponding to a sequence of at least one of SEQ ID NOS: 4, 9, 39, 42, 52, 62, 65, 66, 68, 74, 81, 114, 123, 144, 130, 157, 162, 172, 178, 183, 202, 214, 219, 223, 258, 298, 317, 338,
10 379, 384, 386, 388, 1, 39, 52, 97, 119, 134, 172, 176, 241, 288, 317, 357, 362, 374, 9, 34, 42, 62, 74, 106, 119, 135, 154, 160, 260, 308, 323, 349, 361, 369, 371, 379, 395, 381, and 400;

wherein detection of the differentially expressed gene product is correlated with a cancerous state of the cell from which the test sample was derived.

19. The method of claim 18, wherein said detecting step is by hybridization of the
15 test sample to a reference array, wherein the reference array comprises an identifying sequence of at least one of SEQ ID NOS: 1-844.

20. The method of claim 18, wherein the cell is a breast tissue derived cell, and the
20 differentially expressed gene product is encoded by a gene corresponding to a sequence of at least one of SEQ ID NOS: 4, 9, 39, 42, 52, 62, 65, 66, 68, 74, 81, 114, 123, 144, 130, 157, 162, 172, 178, 183, 202, 214, 219, 223, 258, 298, 317, 338, 379, 384, 386, and 388.

21. The method of claim 18, wherein the cell is a colon tissue derived cell, and the
25 differentially expressed gene product is encoded by a gene corresponding to a sequence of at least one of SEQ ID NOS: 1, 39, 52, 97, 119, 134, 172, 176, 241, 288, 317, 357, 362, and 374.

22. The method of claim 18, wherein the cell is a lung tissue derived cell, and the
30 differentially expressed gene product is encoded by a gene corresponding to a sequence of at least one of SEQ ID NOS: 9, 34, 42, 62, 74, 106, 119, 135, 154, 160, 260, 308, 323, 349, 361, 369, 371, 379, 395, 381, and 400.

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Products I
- <130> 2300-1480P
- <140> 09/
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cntgccggtc ttgctcnttt tgtctaccnn gagganannn ntntgggaca tcccagactg	180
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cctcntgaat aaatgcaata aantttcngt tgatcttata caccttatgc nccntantta 240
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aaatgacgnn nnnnnnnnnn cccatggtaa atgtnaatat actgcgtctn ttttgggana 240
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cacttgcttc aaaagttact atggtgctta agattgtctt gatctgacat atatcacctt 240
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tctagtgtaa	tgaatcggat	ggctggaatt	tttgatgtaa	acacctgcta	tgggtcaccg	240
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ataccagtcc ttttacagat ataatagata cagcttctga ggtggagggg gataggagtg	180
tgtagagaaa ttgcagttca gaactggagc atgcagttag gcaagaggca tcccatgtga	240
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agagtgcatt ttacacggc tagcaggggt tgagactgca gcctggcctg ccagccattg	240
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cagctgatat atttggatac cagttgacta tttttaggaa aaaaacacaa atggctttta	240

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 atgctctct ctaccagct tcagggcgga gctcaccagt ggaaagtctg aagaaagagt 240
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 cacagtctat acagaatact gtttataatg atgggcagtc ttcggccatt cctgtagcca 240
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gcttcttcac	ccagacacca	aggtatgaga	tggccctgcc	aagtgtcggc	ctctcctggt	180
aaacaaaaac	attctaaagc	cattgttctt	gcttcatgga	caagaggcag	ccggagagag	240
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<210> 36

<211> 300

<212> DNA

<213> Homo sapiens

<400> 36

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tcgagtccat	gtgggtctctg	gggaccatga	ctattgtgtc	cggagcagga	ccccccaaa	180
aaagatgcct	gccctagtca	ttccagaggt	gggtctccga	tggaatgtca	agcgccatca	240
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<210> 37

<211> 300

<212> DNA

<213> Homo sapiens

<400> 37

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ggtcagccc	tctgactctt	tcctcatggt	agagacaact	gcatactttg	aggcctacag	180
gcacgtcctg	gaaggactcc	aggaggtcca	ggaggaagat	gttcccttcc	agaggaatat	240
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<210> 38

<211> 300

<212> DNA

<213> Homo sapiens

<400> 38

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cccaaacgct	gcctcttggt	gacagactca	gccccaaacc	ccttccttct	gtctctggag	180
acccttgagc	ttggggaaat	atggaggggt	gtgtgtctgc	aatcaaggcc	tctgcagctc	240
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<210> 39

<211> 300

<212> DNA

<213> Homo sapiens

<400> 39

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aggccagctg	aggcatggcg	acccctggga	aggagcgggc	gtgaggccag	ctgaggcatg	120

gtgacccctg	ggaaggagcg	ggcgtgaggg	cagctgaggg	atggtgaccc	ctgggtacgg	180
gggacttggg	ggccgcacct	tggtttgccc	agggccccctc	ctgcaccacg	ggccacatgc	240
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<210> 40
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 40						
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aagtactatg	cagagctgtg	tgccccacct	gggaacagtg	atcctgagca	gctgaagaag	240
gaactgaatg	aactggtcag	tgctattgaa	gaacattttt	tccagccaca	gaagtacaat	300

<210> 41
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 41						
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gaaagtcttc	cccagtccaa	ggagcagtcg	tgtctgacct	acattgggct	tttctcagaa	240
ctttgaacga	tcccatgcaa	agaattccca	ccctgagggt	ggttacatac	ctgccc aatg	300

<210> 42
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 42						
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cgtggcctta	atgaaggaag	aaggggtgaa	acttctaaga	gaagcaatgg	gaatttacat	180
cagcaccctc	aaaacagagt	tcacccaggg	catgatctta	cctacaatga	atggagagtc	240
agtagaccca	gtggggcagc	cagcactgaa	aactgaggag	cgcaaggcta	agcctgctcc	300

<210> 43
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 43						
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tgtgggcat	tatgcttcct	atatcaagcg	ggaagcaaat	gggcaaggcc	acttccaaga	180
aagatccttc	tgtaaggctc	tgacctccaa	gaccaaccgc	cgatttgtga	agaagtttgt	240
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<210> 44
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 44
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 aaaggtggat cctacatgtg ccataggtct tattgttaca ggtatcgctg tgctgctcgg 180
 agccagaaca cacctgatag ctctgcttcg aatctgggat tccgctgtgc agccgaccgg 240
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<210> 45
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 45
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 tctcacacct ggcgagctgt ggcattgcttt taaacagagt tcatttccag taccctccat 180
 cagtgcaccc tgctttaaga aaatgaactt atgcaaatac acatccacag cgtcggtaaa 240
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<210> 46
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 46
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 tctcacacct ggcgagctgt ggcattgcttt taaacagagt tcatttccag taccctccat 180
 cagtgcaccc tgctttaaga aaatgaactt atgcaaatac acatccacag cgtcggtaaa 240
 ttaaggggtg atcaccaagt ttcataatat tttcccttta taaaaggatt tgttggccag 300

<210> 47
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 47
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 gagtttctgg agagaatgat tctgagctcg gttttgacaa aagaggagct gctgaggcta 120
 aaagtggatg aaaaggcct tataattaaa agaaacaaga caggactcag aggtgtgaaa 180
 caaatattat gcatggtgaa ttacaatgag ttgggggtat tctgtagccc taaagtacaa 240
 ggtataaaga gacagaaaat gatcctggaa tatagacaga ggataactta tctctcatga 300

<210> 48
 <211> 300
 <212> DNA

<213> Homo sapiens

<400> 48

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agacccgccc	cccaacgcca	ctctaccccc	ctgctttgaa	ctatgctttg	agaaatgagc	180
ttatgagacc	actgagactt	gggggctggt	tgttcagcag	ttcacctaca	cttattagga	240
aaggttgact	tcttgtaact	acgcctttcc	ttaaatacat	ttttgtataa	ttctcagaag	300

<210> 49

<211> 300

<212> DNA

<213> Homo sapiens

<400> 49

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atatgctoga	tggatagcat	tactggaac	cactatgaga	agattatagg	aaaaacacca	180
agactagagg	actctgggtt	ccttttatgc	aaagtcaact	cttctgggtc	acagttaccc	240
agcaacaaaa	ataaagagag	gaccaggacg	atgccagcac	cccgtttatc	ctgagtgaac	300

<210> 50

<211> 300

<212> DNA

<213> Homo sapiens

<400> 50

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taacctcagg	tgatccacct	gccttggcct	cccaaagtgc	tgagattaca	ggcgtgagcc	180
accgcgcctg	gcctgattgg	ttttttaaca	tgatttttct	ctaagcttaa	ataccacaag	240
gccaaagaga	aatggtcata	atttaaacca	ttattatatt	ggtgaggtat	ccctagctat	300

<210> 51

<211> 300

<212> DNA

<213> Homo sapiens

<400> 51

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gtaaccagga	agaccttagt	aaggactctc	taggtcctac	caaatacaagc	aaaattgaag	180
gagctggtac	cagtatctca	gagcctccgt	ctcctatcag	tccgtatgct	tcagaaagct	240
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<210> 52

<211> 300

<212> DNA

<213> Homo sapiens

<400> 52
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 aatttgtttt cctttgtgga tgaagtggga gtaagacttg ttgctgtgag gattagatga 180
 agtggctagg atatggacac actttacttg aattggaaaa caagccatgt atccctaatac 240
 tgcaaatgt ggcatgtcac acgtgtaatc tctgaggttt agtttttgct caagattgca 300

<210> 53
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 53
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 cctattctga aatggggctt ctctttattg tcctgagtca tccctgtgcc aaagagagtg 180
 agtcgttgcg aagccctgtg tttcagctca ttgtgattaa ccctaagacg actctcagcg 240
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<210> 54
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 54
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 catgtttgtt ttctaacagt ttttttttaa gcttttgaga taattttaga cttacagaag 120
 agttgtaaaa gtagtagagt tcttgatatac tctgcaccca ccttgccctt atgttaacat 180
 cttacgtaac aatagaacat ttgtcaaaat taagaaatta accttgatat aatactaact 240
 aaagtagaaa gtttaaaaag tagagatttt agtcttttca ctaatgtcct tttactgttc 300

<210> 55
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 55
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 ccctgtccca ccgtgtccg cggtgaggac agtgagggca gtgctacgtg gtggggaggt 180
 gtgtgagaag ccacggaagg gcttcacagg gcagatgcca aggccagtgg gccccggaca 240
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<210> 56
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 56
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 ctgtttttgc ctaaacagaa tccctttttc ctttttttgt taaaagtact catccctaata 120

attacattgt	tctggaagga	ctgaaaataa	cagaactcag	caccatgatc	ggaccgggac	180
aatcagatta	tttcattcct	cagcaaacgg	agatcgatcc	gaaaagtgga	aatatgagct	240
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<210> 57
 <211> 276
 <212> DNA
 <213> Homo sapiens

<400> 57						
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ccacccccca	cgcccgaaca	gcaggggcag	agccagnnnn	nnntcgaagt	gtgtccnngt	120
tgtcttttga	nccttgtnnt	ggngccttgc	ctanatgtat	ntnntntnnn	tntnntnatt	180
tnnnnntnn	ntnnnttnt	ntnntaaat	tgnttnnaan	ttntnntann	ttnttnmatt	240
nnnnnnnnnn	ntantgtnnt	gnattgntat	nnatca			276

<210> 58
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 58						
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tggcttttctg	gtttgcccc	atgtggtcta	ttcttgatgc	agctaccaa	gtaatgtttt	120
aaaaccatta	taccaagtta	ctatccttgc	caaaaccccc	agtaactgcc	aatctcactt	180
agaataaaa	ccggactcct	gtgaagcaca	gcataaactg	gccactgcct	atgcagcaac	240
ctcatcttta	cgttttctg	ccttgctcac	tcccttccag	cgccgttatt	cttcttgatg	300

<210> 59
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 59						
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aagtctcttt	cttgcccatc	accacatccc	tagtactggg	tatcagtctg	gccacttggc	120
tttctgggtt	gccccaatgt	ggtctattct	tgatgcagct	accaaagtaa	tgttttaaaa	180
ccattatacc	aagttactat	ccttggtcaa	acccccagta	actgccaatc	tcacttagaa	240
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<210> 60
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 60						
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gtcttattaa	aagccaccac	tttgctgagg	cctgtacagg	ccttgggggt	ttggggaaga	120
gaaataaggc	aggcacttgt	cccttcaggg	agggacttgt	ccctcactgg	gagggttggg	180
gttgaccttg	gctccagcag	agatacccag	cctggcgtgg	aaggggcagg	tctgagctta	240
cgcttgactg	cagggcaagc	tgcaggcctc	ttctgccttc	ccctgcattc	accaaggaca	300

<210> 61
 <211> 292
 <212> DNA
 <213> Homo sapiens

<400> 61
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 ctgtngnggt aaagngntca ccctctcaca gcaccaccag cggcgagaca gacccacca 120
 ccattcttccc ctgcaaggag tngggcaaag tcttcttcaa gatcaaaagc cgaaatgcac 180
 acatgaaaac tcacaggcag caggaggaac aacagaggcn aaaggctcag aaggcggtt 240
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<210> 62
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 62
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 gcttatcagt atgaaagtca agtatcagtc actaaagaag caaaatgtat ttaacagaga 180
 acagatgcac agaatgaagt tacaaattgc cagttgcta cagatgaaag ggtctcaaac 240
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<210> 63
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 63
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<210> 64
 <211> 294
 <212> DNA
 <213> Homo sapiens

<400> 64
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 gtgcccgtg cttccggtgg gtgcaggtgg aatgttctgt gcgagagctc aagggtgccc 120
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 agagcaccag acatctgcct actctcctcc acgtgcaggc caagagcact gaagacaccc 240
 tggctctccc ggaagggcag tcccacaggc agcggcaccc atttctgggc cccg 294

<210> 65
 <211> 300

<212> DNA

<213> Homo sapiens

<400> 65

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atcttcagaa	gggcttcgcc	taagctggaa	catggataga	ttccattcta	acataaagat	180
ctttaagttc	aaatatagat	gagttgactg	gtagatttgg	tggtagtgtc	tttctcggga	240
tataagaagc	aaaatcaact	gctacaagta	aagaggggat	ggggaagggtg	ttgcacattt	300

<210> 66

<211> 300

<212> DNA

<213> Homo sapiens

<400> 66

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gggcctatta	caaaggcttg	gaaaaagcac	tcaagccagc	taatatgtta	gaacggctaa	180
aaatttatga	ggaagcctgg	actaaatatc	ccaggggact	ggtgccaaga	aggctgccgt	240
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<210> 67

<211> 300

<212> DNA

<213> Homo sapiens

<400> 67

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anctaaacaa	cagacacatg	taagaaaaca	ccagtttgat	catggagagc	tggtttacca	120
tgcatcgcaa	ttgttagcat	atacagccct	tggtatttta	attatgagac	taaaactctt	180
cttgacacca	cacatgtgtg	ttatggcatc	actgatctgc	tcaagacagc	tatttggtatg	240
gctcttttgc	aaagtacatc	ctggtgctat	tgagtttgct	atattagcag	caatgtcaat	300

<210> 68

<211> 300

<212> DNA

<213> Homo sapiens

<400> 68

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aagctgccgg	ttatttaacc	ccaatgatga	tggaaggag	gaaccaccaa	ccacattact	120
ttgggtccag	tactacttgg	cacaacatta	tgacaaaatt	ggtcagccat	ctattgcttt	180
ggagtacata	aatactgcta	ttgaaagtac	acctacatta	atagaactct	ttctcgtgaa	240
agctaaaatc	tataagcatg	ctggaaatat	taaagaagct	gcaagggtgga	tggtatgaggc	300

<210> 69

<211> 300

<212> DNA

<213> Homo sapiens

<400> 69
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ccacaatgga ggcttcacca aggcgtggtt tgccatgaag acctttctta cgccagcat 180
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<210> 70
<211> 300
<212> DNA
<213> Homo sapiens

<400> 70
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ttgtataact caatagaaca agcattttta ataaatttct cgtaagtgtt tgctttcttt 120
atgtgggtggg tgtggcttta aagagcacia aaccacaaca aatcaaagag tagctcgggc 180
ttgtcttttg ctttatggct gagggtttga aggatgattc atggacttgt gaatgccagc 240
cccagtcceg gcttaggtct atctgccaat accaccaggg ccaacaaatt cagcgaacaa 300

<210> 71
<211> 300
<212> DNA
<213> Homo sapiens

<400> 71
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gaaggaatag ttatatcaat acaccagtgg ctgaaattat catgaaacca aatgttggac 120
aaggcagcac aagtgtgcaa acagctatgg aaagtgaact cggagagtct agtgccacaa 180
tcaataaaag actctgcaa agtacaatag aactttcaga aaattcttta cttccagctt 240
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<210> 72
<211> 300
<212> DNA
<213> Homo sapiens

<400> 72
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aacagatgct tgatgttgta gaaactggga catatagata ccaagcaaaa ttataagaaa 180
cctataaggt gttcaatacg cttgtgtttc caaaattcac tgtacatgat cagtttggtg 240
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<210> 73
<211> 300
<212> DNA
<213> Homo sapiens

<400> 73
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gttgatcaat gaccattttt gctcagcatg gagaaacagt gcctgcatg aagggtagtg 120

agaataaaaa	ggatcttacc	acctttatca	tgaggggtggc	tttgctctct	ccattccaag	180
ttgtttctctg	ttctagaaag	cagatgtagt	agacatctac	tgtttttgcc	taaacagaat	240
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<210> 74
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 74						
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caaaactctc	ttcctttagg	gctactgaga	cttgattcct	gatcatcaga	aatttcacca	180
gaaacaactt	gcttccaata	taccaattc	tatatgaaga	attcatggag	agtgtactgg	240
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<210> 75
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 75						
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gaccctcagc	ctgcggtatgc	ctctagaaac	ctcgtgttga	ttgcaggagg	agtcggaatt	180
aaccctctgc	tttccatcct	gcggcacgca	gcagatctcc	tcagagagca	ggcaaacaaa	240
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<210> 76
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 76						
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aggtgatatt	aaaattgaag	tcttctgtga	gaggacaccc	agaacatgtg	agatggagtc	180
tcgctgtgtc	ccccaggctg	gagtacaatg	gcgcgatctc	ggctcactgc	aacctccgcc	240
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<210> 77
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 77						
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gttgacact	ggcattttct	tgctgcaagc	ttttttaaat	ttctgaactc	aaggcagtgg	180
cagaagatgt	cagtcacctc	tgataactgg	aaaaatgggt	ctcttgggcc	ctggcactgg	240

ttctccatgg cctcagccac agggccccct tggacccccct ctcttccctc cagatcccag 300

<210> 78

<211> 300

<212> DNA

<213> Homo sapiens

<400> 78

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 aacgcatgac cacagatatc aatgcactga agcggcagta ctctcgaatt aaaaagaagc 120
 aacagcagca gggtcatcag gtgtacatca gggcagacaa agggccagt accagcattc 180
 tcccgtctca ggtaaacagt tctccagtta taaaccacct tcttttagga aagaagatga 240
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<210> 79

<211> 278

<212> DNA

<213> Homo sapiens

<400> 79

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 gcagccgcgg ctgggggaga ctcccttgcc ccattctttg ccggtttcct gccattattg 180
 gtgtgcaaga caaaacaggg ctgcacagtg gcagagaagt cctttgcagt ggggaccttg 240
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<210> 80

<211> 300

<212> DNA

<213> Homo sapiens

<400> 80

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 tgagagcagc ccagaacccc tggacaacat cttgttgga gcctttgagt ttgacatcca 180
 tcaagtaatc aaagagtgc gcatcgccct gagcaactgg tggtttgagg cccacctgac 240
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<210> 81

<211> 300

<212> DNA

<213> Homo sapiens

<400> 81

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 agcacctcct cggcacacac gacttcagcg ccttcagtc cgctggcagc ccggtgccga 180
 gccccgtgcg aacgctgcgc cgggtctccg tttcccagg ccaagccagc cccttgggtca 240
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<210> 82

<211> 300
 <212> DNA
 <213> Homo sapiens

<400> 82
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 gggcatggcg gtgcagagga gtttgggagg tgtaaacagc cccatgcacg tggaggagga 240
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<210> 83
 <211> 272
 <212> DNA
 <213> Homo sapiens

<400> 83
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 gttaggaaat ggcattctcat tgttttcatc ttaatttgcg tcagcctgat tactcattga 180
 aacttgtgag gttgagaaac ttttcttaag cttattggcc attcaagttt cctcctttat 240
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<210> 84
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 84
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 aatagagctg cttggttgga ggaagtgaag ctggcttagt accagcagct gatctcttcc 180
 acgtgctgct gctttttttg ccactctgat actaaaccag agaaagctgc aggtggataa 240
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<210> 85
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 85
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 cagcactgat ttcccattag cagttattat ttcttgccca tttcttcttg aagggtttgt 180
 ggttaaaact cctgtcctca atattttatc agcagtaggg ctgtcattct tctggttatc 240
 aacctctaca ttatgaagta aggttcaacc cttctgcttt tctcaggccc ccaaaacggt 300

<210> 86
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 86

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agaatagaaa	catccagaat	gctcctcccc	atcccccaat	cccagacagc	aattatgtca	120
gccctgtaag	gcattgcctg	ctcttgaccc	tttgggccat	ctttttatct	ttaaaaaatt	180
cccatgtcac	agatgcctg	tctatgcaga	gggtggcggtg	ggatgggtga	ccactaagtt	240
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<210> 87

<211> 300

<212> DNA

<213> Homo sapiens

<400> 87

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gcattgtggct	tcccctggaa	gacgagtgat	ttcatgccct	ggaatgtatt	tgacgggaag	180
ctttttcatc	agaagtactt	gcaatctgaa	aagggttatg	ctgtggaggt	tcttttagaa	240
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<210> 88

<211> 300

<212> DNA

<213> Homo sapiens

<400> 88

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gcattactgc	tatgtcagta	aaagaagtcc	ttcaaagctt	agttgatgat	ggtatgggtg	120
actgtgagag	gatcggaact	tctaattatt	attgggcttt	tccaagtaaa	gctcttcattg	180
caaggaaaac	taagtggag	gttctggaat	ctcagttgtc	tgaggggaagt	caaaagcatg	240
caagcctaca	gaaaagcatt	gagaaaagta	aaattggccg	atgtgaaacg	gaagagcgaa	300

<210> 89

<211> 300

<212> DNA

<213> Homo sapiens

<400> 89

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gaaccgatg	tcccacagcc	agatatacac	ccagctccat	gccagccctt	catgtttacc	180
ttttgctttg	tttaattacat	gtcagactcc	tagagggcct	ccagactaat	aggaagcatt	240
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<210> 90

<211> 300

<212> DNA

<213> Homo sapiens

<400> 90

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tgatcccagg	cttagcacac	gattgcatgg	catccccctt	agccacttca	accactgcag	120
acatccagga	agctggactc	tctcctcagt	ccctccagac	ttctggccac	cacagaatga	180
aaaccccatt	ttcaactgag	ctatccttgc	tccagcctga	tactccagac	tgtgctggag	240
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<210> 91

<211> 300

<212> DNA

<213> Homo sapiens

<400> 91

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atttcagact	tggaacatg	cttcaattct	aattcagcaa	cattatcgaa	catatagagc	120
tgcaaaattg	caaagagaaa	attatatcag	acaatggcat	tctgctgtgg	ttattcaggc	180
tgcatataaa	ggaatgaaag	caagacaact	tttaagggaa	aaacacaaag	cttctattgt	240
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<210> 92

<211> 300

<212> DNA

<213> Homo sapiens

<400> 92

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cattgcactt	atcttaccaa	gctcttctga	aggttctatt	tctgaactgg	agcagctctc	180
caattctcta	ccaaataaag	aattgatgac	ctcaatctgt	gactgtctgt	tggtacgct	240
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<210> 93

<211> 300

<212> DNA

<213> Homo sapiens

<400> 93

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ggtactaaaa	agaggtccta	cccacacctg	cctcacactt	ctcctttcca	aggctgcctg	180
agtttgagg	ggcttgggtg	tgtgtgaaca	agggccctgc	attgtctagg	cctgcagttc	240
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<210> 94

<211> 300

<212> DNA

<213> Homo sapiens

<400> 94

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aggcaatctt	cattctgctt	ggctttagtc	attcttgtca	ttgggctgca	gaagaaaaac	180
aactttgctg	ggtgatccca	ctgccttgat	ttcacctcgg	agcgaggctg	ggccatgtcc	240

aagtcttatg aggtcacccct gactagaaaa aattgaactc acctacaaat agtctgaaag 300

<210> 95
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 95
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 cagggtgttg ggcccatata cttcaaagac cagagccctg cactgggaga gtgctcctgg 180
 cccaggtctg gaatcacctt tcgaggccct tcagactctg gcggggcttg ctgtggcctc 240
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<210> 96
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 96
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 gagacagagg gcaaggacca cggccttgaa ctcagcatcc acaggacgcc catcttggag 180
 gattttgagc tcgagggagt gtgccagctc ccagaccagt cgctcccag gaacagcatg 240
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<210> 97
 <211> 286
 <212> DNA
 <213> Homo sapiens

<400> 97
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 tcacncnnnn nnnnnnnnnn nnnnnnnnagg cctaggcggg tggatcacia ggtcagcagt 120
 tcaagaccag cctgaccagc atggtgagac cctgtctcta ctggaaatac aaaaaaattg 180
 gctgggagag gtggcaggca cctgtgggtc cagctacctg ggaggtctgag gcgggagagt 240
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<210> 98
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 98
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 ctttggtttt cccactttta agccacaggg tcgactcatg gatgatacct ctattgctgc 180
 tgcatgatgt tcaagaccgg cccttggctg ttgttacaga gatgttgggc agagctatgc 240
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<210> 99

<211> 300
 <212> DNA
 <213> Homo sapiens

<400> 99
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<210> 100
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 100
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<210> 101
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 101
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<210> 102
 <211> 270
 <212> DNA
 <213> Homo sapiens

<400> 102
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 gncnctactt taaggactnn anacctgtgc 270

<210> 103
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 103

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tgctcagcc cagtttgtgt ctcggtgct ccctgtgctg ttgagcaccg cccaagaggc	240
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<210> 104

<211> 300

<212> DNA

<213> Homo sapiens

<400> 104

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tgtccgttta tcaggacacg ggccccacct gtcacgtgcc cgaggccacc caagcccagc	180
ctgcggggcg ttccactgc ctggatgccg gcttgagttc tgcgcacgca ggattcagtg	240
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<210> 105

<211> 300

<212> DNA

<213> Homo sapiens

<400> 105

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ccccgccctt gggacagcct cctccgtagc ccctgcacgg caccagttcc ccgagggacg	180
cagcagggcg cctcccgcag cggccgtggg tctgcacagc ccagcccagc ccaaggcccc	240
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<210> 106

<211> 300

<212> DNA

<213> Homo sapiens

<400> 106

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cctgctgaag gagtggacag ggcttcatga tgcctatctt gaaactcggg acttcaaggg	240
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<210> 107

<211> 300

<212> DNA

<213> Homo sapiens

<400> 107

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aacaattgga	ggagctgccc	aggcagtttt	atggcctcct	ggttggtgtc	cttcacaccc	180
gcctacagcc	ccacctcacc	atcaagcgct	gagccaatgc	gggtgtggct	ggccctgagt	240
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 <212> DNA
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tgccgcagct	ggcgagccc	acgctcatga	tcgacttcct	cacccgcgcc	tgcgacctcg	180
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<210> 109
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<400> 109						
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attgggcctt	ggaagaagaa	cagccattca	aatagataga	attgtggtag	caaaggcata	120
gaggtaggaa	agtatagatc	tccagggaca	gtagtcatgg	ggttggggca	ctgttggaat	180
ttaaggttgg	aaggatatat	tggagcccct	tgaatacggc	aacaaggcac	accttgggca	240
gtggagagtt	atcagagtgt	ttgaaaagga	gggttattga	gtaaataaat	agactggtac	300

<210> 110
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 110						
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gctgtggccg	tgggctcagg	tggcagctat	ggagccgagg	atgaggtgga	ggaggagagt	120
gacaaggccg	cgctcctgca	ggagcagcag	cagcagcagc	agccgggatt	ctggaccttc	180
agctactatc	agagcttctt	tgacgtggac	acctcacagg	tcctggaccg	gatcaaaggc	240
tcactgctgc	cccggcctgg	ccacaacttt	gtgcggcacc	atctgcggaa	tcggccggat	300

<210> 111
 <211> 271
 <212> DNA
 <213> Homo sapiens

<400> 111						
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tggggggggg	gggggnnttc	ttctannccn	ntacnctatg	tgtttaatnn	ncntantnct	180
ttantantat	ttncantgn	tnntnatatn	nttnnanana	nnctnctta	nnnacattat	240
tttanntang	ngatnntacc	ttnttgnaan	g			271

<210> 112
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 112
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 aattacattt gttcatgatg tcaagtgtct ggtatgtagc taatgcttat tgaacacata 180
 gtaatttatt gaataattgt catgatcact ggatgagata tagccactgt ggaggtaggc 240
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<210> 113
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 113
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 tctacacttt agatgaagag ttaccaaga gagtgaagc tctattttcc acagcctctg 120
 acatgagatt tgaagacacg ttttatggag cagacattat ccaaggggag agaaagagac 180
 aaagagtgtc gagctccagg tttaagaatg aatatgtggc cgaccctgta taccgcactt 240
 ttttgaagag ctctttccag aagaagtgcc agaagagaca gtagtctgca tacatcgctg 300

<210> 114
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 114
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 gcttcaagaa aagaagatac atatgtacat tttaatgtgg acattgagct ccagaagcat 120
 gttgaaaaat taaccaaagg tgcagctatc ttctttgaat tcaaacta caagcctaaa 180
 aaaaggttta ccagcaccaa gtgttttgct ttcattggaga tggatgaaat taaacctggg 240
 ccaattgtaa tagaactata cacgaaaccc actgacttta aaagaaagaa attgcaatta 300

<210> 115
 <211> 288
 <212> DNA
 <213> Homo sapiens

<400> 115
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 gacatggcag cgggtagctc ctggggctga gccagaagca tcaactgcag gaaagtctct 180
 gcttacctgt ctggctcagc ttgggcaagg gctgggccat atgtgctcag ggacgtgctt 240
 ctcttgtaag gcaggaggat anaanaggac cannaanggn gggagctg 288

<210> 116
 <211> 300

<212> DNA

<213> Homo sapiens

<400> 116

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ctggaaaaga gcagtgagag gaggccggga gatgtgtgat gcatgtgaag caacattgtt	120
taacattcac tgggtctgcc aaaaatgtgg atttgtggtc tgcttagatt gttacaaggc	180
aaaggaaagg aagagttcta gagataaaga actatatgct tggatgaagt gtgtgaaggg	240
acagcctcat gatcacaaac atttaatgcc aacccaaatt atacctggtt ctgttttgac	300

<210> 117

<211> 300

<212> DNA

<213> Homo sapiens

<400> 117

gcactttcca gaattctctc atatttgtgg gctgggatca agcctgcagc ttgaggaaag	60
cacaaggaaa ggaaagaaga tctggtggaa agctcagggt gcagcggact ctgactccac	120
tgaggaaactg cctcagaagc tgcgatcaca actttggctg aagccctgc ctcactctag	180
ggcacctgac ctggcctctt gcctaaacca caaggctaag ggctatagac aatggtttcc	240
ttaggaacag taaaccagtt tttctaggga tggcccttgg ctgggggatg acagtgtggg	300

<210> 118

<211> 300

<212> DNA

<213> Homo sapiens

<400> 118

agaacgttct caggttgacc agctgctgaa tatttcttta agggaggaag aacttagtaa	60
gtcattgcag tgcattgata acaatcttct gcaagccgt gcagcccttc agacagctta	120
tgtggaagtt cagaggttac ttatgtcaa gcagcagata actatggaga tgagtgcact	180
gaggacccat agaatacaga ttctacagg attacaagaa acatatgaac cttctgagca	240
cccagggttg gcatagaaat ggtaccctt gttcaaaatg aacaagaagc cttagatttg	300

<210> 119

<211> 300

<212> DNA

<213> Homo sapiens

<400> 119

gaacaaagaa ggaatgtctt cctcatgttt gggctctatag aagacgttaa agaaaacttc	60
cagaaaagtgg gtttgaggca tgagccacca cgcctggcca aaggatttaa tgaattaatg	120
gatgtacagt gctggggctg gtattctagg gcctgcattg agactcacat tttgccatca	180
aaagcctttt aagaggtgga ggttgcggtg agctgacatg gtgccactgc actccggcct	240
gagtgcagaa gtgagactct gtctcacaaa aaaaataatg ccctttaaat aatgaataat	300

<210> 120

<211> 273

<212> DNA

<213> Homo sapiens

<400> 120
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 ttgttttaaag caaagcaaga aacttctgaa gaaatggaac aaagtggaga agcctcagga 120
 aagcccaaca gagagtgtgc accccagatt ccttgtagta ctctattgc tactgaaagg 180
 acagttgcac atttgaacac tctgaaggac cgtcaccag gtgatttgtg ggcccgcag 240
 cacatctcat cccttggat atgctgcagg aga 273

<210> 121
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 121
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 tgtggaagtt cagaggctac ttatgctcaa gcagcagata actatggaga tgagtgcact 180
 gaggacccat agaatacaga ttctacaggg attacaagaa acatatgaac cttctgagca 240
 cccaggtttg gcatagaaat ggtaccctt gttcaaatg aacaagaagc cttagatttg 300

<210> 122
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 122
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 ccagaatgat acacggatca gtgcagaagt tcatcaggct ctgggacctt agggctgttg 120
 gagaaggctt cagcagcaga actgatggtg aaggctcgtg ttctccatcc tcaactttct 180
 ttgcttcgat catacacaag aatacatttg gaagggcaaa aaaatgaaca ctgtcgttca 240
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<210> 123
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 123
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 cctttaaata gcaaagcagc ctacctggag gctaagtctg ggagtgggc tggccctgg 180
 tgtgagcatt agaccagcca cagtgcctga ttggtatagc cttatgtgct ttctacaaa 240
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<210> 124
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 124
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 acacccccac tcctgcccag cctggcctca gggcctctga tccatgtgca ctggagagga 120

gatgactgac	agggccactg	gggcatttcc	acgttaacag	cagctgccac	tggcaaaaga	180
agtgactcgc	caatggaggc	atctcagatg	tgggcccagg	agtctgggga	gctactttga	240
acagggctat	ccattcattg	tcccacaaaa	ggctatggag	cccaccacc	atgtgctgga	300

<210> 125
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 125						
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cccctaagat	gttattatgt	tagggacata	acacttttgg	gaggttggtg	tgggagatgg	120
ttgatttagg	ttttcaaaag	ctagaaataa	aattttacatg	ccttagattt	cataaaattc	180
tgctctaatt	gggtggaagg	tgctgtatct	aacttgtggt	cctoctaagg	ttatgtccta	240
ataactattc	ttttaggagt	atacttctac	tttatagaag	gttgcttttc	tttttaattt	300

<210> 126
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 126						
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aactccaaat	caacagtatt	ttcaacaaga	aatgtgcaat	tgaaatcaag	tgctgtttta	120
gtgcagctag	gatttccaca	ggaagacact	tgcaagtgaac	agagttatgg	agcagcaaaa	180
acacagatct	at ttggaaaa	agagaaaaaca	tatgcgttgt	at tttgcttc	aattataaaa	240
taccatcttc	tcaaagggtg	ttctaaatta	caaaggactt	tgatttctag	gtagattctg	300

<210> 127
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 127						
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gcacatcagg	atcacctggg	ggccttcaaa	aatcaaaaat	ccacccccag	gccatgccct	120
ggacccactg	caccaggaca	agaaatccac	cccaggcctc	tccccagacc	cactgcacca	180
ggacaagaaa	tccacccccca	ggccacgccc	cagaccact	gccctaggat	gtgggggtgg	240
gaaccagggtg	gtgctttgta	aagacgtgca	ggtggtaacc	ccaggccccc	acgctcggaa	300

<210> 128
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 128						
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gtgcaattga	aatcaagtgc	tgtttaagt	cagctaggat	ttccacagga	agacacttgc	180
agtgaacaga	gttatggagc	agcaaaaaca	cagatctatt	tggaaaaaga	gaaaacatat	240
gcgttgtatt	ttgcttcaat	tataaaatac	catcctctca	aaggtggttc	taaattacaa	300

<210> 129
 <211> 285
 <212> DNA
 <213> Homo sapiens

<400> 129
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 ctccactgag gaactgcctc agaagctgcg atcacaaactt tggctgaagc ccctgcctca 120
 ctctagggca cctgacctgg cctcttgct aaaccacaag gctaagggtg atagacaatg 180
 gtttccttag gaacagtaaa ccagtttttc tagggatggc ccttggctgg gggatnnnnn 240
 nnnnnnnnnn nnnnnnnnnn nnaggaagat accatttctt gacgg 285

<210> 130
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 130
 ccggacgcag gccctcgggc aggagcatct ggcagagtgg ggggcgtggc aggcaccctc 60
 ctttgcaggg cgaggtgggg cctctgcagc catcctggac aggccggggt ggcggcagct 120
 ttgcccacgt ggaagcgggg tgggtctcac ttgcgtgggt gcccttgccc ccattctgcc 180
 tgctgcggcc tggggagcag gcgctgggtg gtggttctgc ctgcttgctg ctcgttcccc 240
 gggcatgcgt gggcagcggg gggcatgcgt gggcagcagg gggccgtggg cagcgggggc 300

<210> 131
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 131
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 gctgatgaaa tacgcacagg agggaaatct actgtgttta ggcacaggca gcccagtggt 180
 ataaggagat catattccaa aaggttgtea gttggttggt tgcaacctgg aatgtatttt 240
 cctttagaga ccaggttatc catggtgggt agggccctag agcagctgga aaagatgac 300

<210> 132
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 132
 ctcccatgga ggtggtggga atggcaccga gaagtttgat gacagttatc taatggacta 60
 gaggttgga aactttctgt aaatggccag gtagtaaata gttctgcttt tgaaggcata 120
 tggctctctg cactactcg aggtgaaag cagctataga caatacataa atgaatgagc 180
 gtgagtgtgt tccaataaga aaaaaacatg gctgtttgct tcggccccag ggtgtagct 240
 taccagtctt gtaacagatc acagtttgct cttttggtca caataacttg aaccctccc 300

<210> 133
 <211> 269
 <212> DNA

<213> Homo sapiens

<400> 133

atgctatgcc	aaagcctgct	gccagctcca	tagcctggac	ctacagcact	gcatggtgga	60
gtccacagct	gtggtgagct	tcttgaggga	ggcaggggtcc	cgaatgcgca	agttgtggct	120
gacctacagc	tcccagacga	cagccatcct	gggcgcactg	ctgggcagct	gctgccccca	180
gctccagggtc	ctggagggtga	gcaccggcat	caaccgtaat	agcattcccc	ttcagctgcc	240
tgtccaggct	ntgcaaaaag	gctgccctc				269

<210> 134

<211> 300

<212> DNA

<213> Homo sapiens

<400> 134

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tttccgacag	agaaaggaat	ctgtagtcca	gcacttgatc	catctgtgtg	aggaaaagcg	180
tgcaagtatc	agtgatgctg	ccctgttaga	catcatttat	atgcaatttc	atcagcacca	240
gaaagtttgg	gatgtttttc	agatgagtaa	aggaccaggt	gaagatgttg	acctttttga	300

<210> 135

<211> 300

<212> DNA

<213> Homo sapiens

<400> 135

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atggatgaga	ctgttgctga	gttcatcaag	aggaccatct	tgaaaatccc	catgaatgaa	120
ctgacaacaa	tcttgaaggc	ctgggatttt	ttgtctgaaa	atcaactgca	gactgtaaat	180
ttccgacaga	gaaaggaatc	tgtagtccag	cacttgatcc	atctgtgtga	ggaaaagcgt	240
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<210> 136

<211> 300

<212> DNA

<213> Homo sapiens

<400> 136

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aggagtccgg	gagatgtgtg	atgcatgtga	agcaacattg	tttaacattc	actgggtctg	180
ccaaaaatgt	ggatttgtgg	tctgcttaga	ttgttacaag	gcaaaggaaa	ggaagagttc	240
tagagataaa	gaactatatg	cttgatgaa	gtgtgtgaag	ggacagcctc	atgatcacia	300

<210> 137

<211> 300

<212> DNA

<213> Homo sapiens

<400> 137

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gcccacagc ttttatcccc attcttagag catattcttt attataatga ttatccaaca	180
tatttcttta attttaatac aaaaaataca tcatttaatt tttgttacat atgaacattc	240
atttttaaat gctcagcctc aagtgcagggc atttttgagt ggcttgatta catattcctc	300

<210> 138

<211> 300

<212> DNA

<213> Homo sapiens

<400> 138

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gcaaaaaatt ccaacccttt tcctcccagt cattgaaaca ccaaaactat tataccggag	120
ggtgtaatag ttttctgcc cagttgtggg aggccagtag tggcctccca agatgcccac	180
gtcctaatac caggaaacctg tcaaaattac cttgtatggc caaaggggct ttgcagatgt	240
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<210> 139

<211> 300

<212> DNA

<213> Homo sapiens

<400> 139

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gaagctgtga acagtaccat cagtaacatt ttatggacag ctctgatggg ttttatacca	180
cggcactctt cttacccttg ggggaagcta tctggagtta tgactgatgt gtaaagtggg	240
ttactgttag aatcctgggt tgctaggatt ctgggagagt cactttcagg aagttacctg	300

<210> 140

<211> 300

<212> DNA

<213> Homo sapiens

<400> 140

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cctcaccatc aagcgctgag ccaatgcggg tgtggtggc cctgagttcc tgagtcagct	120
ccttgccagg gccagagctg gtaacagcgg ggcagcaggg tgggtagcct ctaccagcca	180
gggcagtccc tgagggggcca gcaggggggc tgactgccta gtggctcaac ctctgaacc	240
caccactccc cagcgatgct acccagaacc ccaacggcat gaatcctgca cagtgcgggg	300

<210> 141

<211> 300

<212> DNA

<213> Homo sapiens

<400> 141

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gaatatctac tgtgcgcaa gcagtgcgtc acaactttat gaagtaggta ttattatcat	120
ccccatttta caggtgaaga aactgagtct ctgagagacc aacttttcca aggtcacaca	180

gaggtgggat ccagccact tccgtctgac cccaagcccc tgctgttaac ccctgcccc 240
 ttgtggggag gttccggccc actctggagt tctctggtct gcgtcagtc tcaggagaag 300

<210> 142
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 142
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 ctccccaggc cctgtgacct cctcctgtc ttgcagctcc tctggcacc agtccccagg 180
 gctctctgt tggtagttcc tgcttttctt cttggaaatt cctcgtggac ctcgagatct 240
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<210> 143
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 143
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 tggacatgaa accctttgtg ctctgaagca ttcaacagaa gctttctggt tctgtgccta 240
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<210> 144
 <211> 300
 <212> DNA
 <213> Homo sapiens

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 tccaagaag gtacagaagt ctttgcaaga aaccattcag tccctcaagc ttaccaacca 180
 ggagctgctg aggaagggtg gcagtaacaa ccaggatgtc gtcacctgtg acatggcctg 240
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<210> 145
 <211> 300
 <212> DNA
 <213> Homo sapiens

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 tttggtgctc tgcccaggag ctggtgggat ccgagggggc ctacaaggcg gccgtggaca 180
 gcttctctca gcagcagcat gtgctggggg cggggggtgg tctggnccg actcaagggg 240
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<210> 146
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 <212> DNA
 <213> Homo sapiens

<400> 146
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 aggcctggcg cagtgactca tgcctgtgat cccagcactt gggaggccga ggcgggtgga 180
 tcatttgagg ccaggagtgc gagaccagct tggccaacat gatgagaccc cgtctctatt 240
 aaaaatacaa aaattagcca ggcgtggtgg cgctgtagt cccagctact caggagggtg 300

<210> 147
 <211> 295
 <212> DNA
 <213> Homo sapiens

<400> 147
 ggnaangcna nngnaggaga nagagaagna ncagtnnagn cccangaaac ccnntgaaac 60
 ccttagaagn cagaggagng aaaggangaa aaanangggn ggangagAAC nnannnnngn 120
 caaannaagg anganngnta ggngngaaaa anaanaacaa anggggaaaa ngggaaaaaa 180
 ggcganaaaag gnaanannag nanaaggngg aananannnn annagaaagg ncaanaaaaag 240
 aagnacaaaag aaaaangana anaagnaann annanangga cagagacaag aagga 295

<210> 148
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 148
 cgctgtgctt gagaccaacc tgacgggtac cttctacatg tgcaaagcag ttacagctc 60
 ctggatgaaa gagcatggag gatctatcgt caatattcatt gtccctacta aagctggatt 120
 tccattagct gtgcattctg gagctgcaag agcagggtgtt tacaacctca ccaaattctt 180
 agctttggaa tgggcctgca gtggaatacg gatcaattgt gttgcccctg gagttattta 240
 tccccagact gctgtggaga actatggttc ctggggacaa agcttctttg aagggtcttt 300

<210> 149
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 149
 agtgtcagtt ttcctaattc cagtccaggt aggaattaag aaatatctca agtgttgatg 60
 ctatccaagc atgttgagggt ggaagggaat tgggtgccag aaaatgggac tggagtggag 120
 aatatctttt cttttgagag tccccaggt ttatttctac tgtgctttat tgctactgtt 180
 ctttattgtg aatgttgtaa cattttaaaa atgttttgcc atagcttttt aggacttggt 240
 gttaaaggag ccagtgttct ctctgggtgg gtactataat gagttattgt gaccacagc 300

<210> 150
 <211> 300
 <212> DNA

<213> Homo sapiens

<400> 150

tgtagacttt atgtcagttc tgtgtagact ttatgtcagt ttttgtcatt atttgaaaat	60
ctattctgac aacttttttaa ttcctttgat cttataagtt aaagctgtaa caactgaaat	120
tgcattggatc aagtaagcat agttttatcc agggagaaaa ataaaaggaa gccatagaat	180
tgctctgggc aaaaccaagc acaccatagc cttactgaa tatttaggaa atctgcctaa	240
tctgcttata tttggtgttt gttttttgac tgttgggctt tgggaagatg ttatttatga	300

<210> 151

<211> 300

<212> DNA

<213> Homo sapiens

<400> 151

gcgggcccg ccagcgaag cccctgcgc cgcgccatgt caaagaaaaa aggactgagt	60
gcagaagaaa agagaactcg catgatggaa atattttctg aaacaaaaga tgtatttcaa	120
ttaaaagact tggagaagat tgctcccaa gagaaaggca ttactgctat gtcagtaaaa	180
gaagtccttc aaagcttagt tgatgatggt atggttgact gtgagaggat cggaacttct	240
aattattatt gggcttttcc aagtaaagct cttcatgcaa ggaaacataa gttggaggtt	300

<210> 152

<211> 300

<212> DNA

<213> Homo sapiens

<400> 152

gatattcaca cagtatgtat tatattaacc atatcacact taagttatta aattcagact	60
atttgtaact tattgttata gggcctgcgc tatggcttag gatatttgag taatcatata	120
tttaaagtaa aaactttggg ctgggcacag tggtcacac ctgtaatccc agcacttggg	180
gaagctgagg tgggcagatc agttgaggtc aggagttcta gaccagcctg gtcaacatgg	240
cgaaccccca tctctactaa aaatacaaaa attagctggg cgtggtggca cacacctgta	300

<210> 153

<211> 300

<212> DNA

<213> Homo sapiens

<400> 153

cagagaccag cttctccag aggctgtcac tgcaggagcc gtgggcctgg gaagacttgg	60
aagcggcctc tctcaactgg tttctgtctc cgtggagctg gaactgcctg cacttgcctt	120
cagagggagg cacagtccac ccagatccac ctttccagca agacccccag tggctgcca	180
gcctgggagc acctctttgc ttttcacacc aaacaaaaac tggcgagagc ccctcctagc	240
caccagtgat cccaagcat ccagtacaga accaggcatc gagctagctc cctgcacggc	300

<210> 154

<211> 300

<212> DNA

<213> Homo sapiens

<400> 154
 cttgacctct gtacttttaa gaaatcacta accaaatttt caaagtttcc ttttaaagtc 60
 gtttagctag aaatctatgt atttatccct ttctattttt gcattcttct cccactattt 120
 ttaaaaaactc atttacagta gaaaccattc ttctttctcc caacagtatc ctttgccaag 180
 accatgagaa cagtatggga gcatgttggt ggtcagggtt tcagaatacg cgtgatgtca 240
 ctgagaatgt ttgctcacag tcaataattg tctttgtgga tgtgataatt ttggagatac 300

<210> 155
 <211> 81
 <212> DNA
 <213> Homo sapiens

<400> 155
 gatcattggt aattagtgac atagtaacat ctgtagcagc tggtagtaa acctcatgtg 60
 ggggagggtg gggaggtttt a 81

<210> 156
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 156
 ggcagcacia gtgtgcaaac agctatggaa agtgaactcg gagagtctag tgccacaatc 60
 aataaaagac tctgcaaaag tacaatagaa ctttcagaaa attctttact tccagcttct 120
 tctatgttga ctggcacaca aagcttgctg caacctcatt tagagagggg tgccatcgat 180
 gctctacagt tatgttggtt gttacttccc ccaccaaacc gtagaaagct tcaactttta 240
 atgcgtatga tttcccgaat gagtcaaaat gttgatatgc ccaaacttca tgatgcaatg 300

<210> 157
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 157
 ctggtgagga gtctttgcga gagcgaggag cagcggttac tggaacagggt gcatggcgaa 60
 gaggagcggg cccaccagag catcctgaca cagcgggtgc actgggcccga ggcgctgcag 120
 aaacttgaca ccacccgac tggcctgggt ggcatgctta ctacacctga tgacctccag 180
 ctgattcaga aggagcaaga gattttcgag aggaccgaag aagcagaggg cattttggat 240
 ccccaggagt cggaaatggt aaactttaat gagaagtgc ctcggagccc actactgacc 300

<210> 158
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 158
 cgacagctct ccaataactca ggttaatgct gaaaaatcat ccaagacagt tattgcaaga 60
 gtttaatttt tgaaaactgg ctactgctct gtgtttacag acgtgtgcag ttgtaggcat 120
 gtagctacag gacattttta agggcccagg atcgtttttt cccagggcaa gcagaagaga 180
 aaatgttgta tatgtctttt acccggcaca ttccccttgc ctaaaataca gggctggagt 240
 ctgcacggga cctattagag tattttccac aatgatgatg atttcagcag ggatgacgtc 300

<210> 159
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 159
 agtaccacaga gttgcgagga gttttttaac tgatttagcc aggtggcaat catgagtga 60
 tggatgaaga aaggccctt agaatggcaa gattacattt acaaagaggt ccgagtga 120
 gccagtgaaga agaatgagta taaaggatgg gttttaacta cagaccagat ctctgccaat 180
 attgtccttg tgaacttcct tgaagatggc agcatgtctg tgaccggaat tatgggacat 240
 gctgtgcaga ctgttgaaac tatgaatgaa ggggaccata gagtggagga gaagctgatg 300

<210> 160
 <211> 294
 <212> DNA
 <213> Homo sapiens

<400> 160
 ctttgagcta ggataaaaat tgggtaaagg acatttgctt acctgcaaat gaatcactgt 60
 ggaaatgtga tcttcccata tcatcaagaa acttggtttc tggatgaata ctgggagaat 120
 aaaatgagaa ctctggagtg agctaaattg atcccaatta agtttttctg cttagcagac 180
 agaaggtata attttttgac accctttccc acctggtgcc tatgctaggc ttgtntctgat 240
 aacatccctc actnactnga tnntcacatn gnncttnenc tgangtccca tttt 294

<210> 161
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 161
 ctctctcaaa gcatggttgc tgagtaccca gagttgcgag gagtttttta actgatttag 60
 ccagggtggca atcatgagtg aatggatgaa gaaaggcccc ttagaatggc aagattacat 120
 ttacaaagag gtccgagtga cagccagtga gaagaatgag tataaaggat gggttttaac 180
 tacagaccca gtctctgcca atattgtcct tgtgaacttc cttgaagatg gcagcatgtc 240
 tgtgaccgga attatgggac atgctgtgca gactgttgaa actatgaatg aaggggacca 300

<210> 162
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 162
 gccccgtgtg gggagacgga cagcaccctc ctcatctggc aggtgccctt gatgctatag 60
 cgcctcccct ctcccctcag agggcacagc tgcaggcctg accaaggcca cgcctggctc 120
 tcgtgctcta ggacctgcac gggacttgtg gatgggcctg gactctccag aaactacttg 180
 ggccagagca aaggaaaacc tcttggttta aaaaaatttt tttcagagtg ttttggggag 240
 gagtttttagg gcttggggag agggaggaca catctggagg aaatggcctt ctttttaaaa 300

<210> 163
 <211> 300
 <212> DNA

<213> Homo sapiens

<400> 163

gaccggctgg	gcctacaaaa	agatcgagct	ggaggatctc	aggtttcctc	tggtctgtgg	60
ggagggcaaa	aaggctcggg	tgatggccac	cattgggggtg	acccgaggct	tgaggagacca	120
cagccttaag	gtctgcagtt	ccaccctgcc	catcaagccc	tttctctcct	gcttccttga	180
ggtacgagtg	tatgacctga	cacaatatga	gcactgccca	gatgatgtgc	tagtcctggg	240
aacagatggc	ctgtgggatg	tcactactga	ctgtgaggtg	tctgccactg	tggacagggg	300

<210> 164

<211> 300

<212> DNA

<213> Homo sapiens

<400> 164

aaaatttata	ngtaatgaca	aatgacttat	cagtgttcat	catctgaaag	ctaagtgggt	60
cgttcaatca	ctttttcaaa	gttgatagta	gattgcatgg	tttcatgttt	cctcatattg	120
gtttattaat	tctatttaat	caaggaaaat	aacttcagat	tccataaagt	ttcagtttat	180
ttttagttta	ctactaggtg	agatagcaca	ttacatactt	ttactatcaa	atattatttt	240
agcagcttcc	catagtacca	aatgatttga	ttccctactc	tcatttttta	aagcatataa	300

<210> 165

<211> 300

<212> DNA

<213> Homo sapiens

<400> 165

ctggactctg	agtcgtcttg	gtcccaggag	ccagtagtga	aggcaacagt	ctgcccacct	60
gtggacacca	gacccctggg	gtccctgggt	agcaagtggg	atctctggga	tgtcagtggg	120
gctgggtgaa	gaccagaggt	aaactgcaga	ggtcaccacc	cccaccatgt	cccagggtgat	180
gtccagccca	ctgctggcag	gaggccatgc	tgtcagcttg	gcgccttggt	atgagcccag	240
gaggaccctg	caccagcac	ccagccccag	cctgccaccc	cagtgttctt	actacaccac	300

<210> 166

<211> 300

<212> DNA

<213> Homo sapiens

<400> 166

cttctgttga	ttggtttggt	taaagtacct	aagtactacc	ctttgactcc	ctacaaaag	60
ttcttttggt	ttttaaacia	cttttatttg	tgacttactt	tcttgagaag	tgttcttaat	120
gaattgcata	aaatagtggg	agcagcttat	ttcttaagta	ctttattatt	tgtgctttac	180
catttcaggt	tcttatcttt	aacccttatt	tactcagttt	tccatctgaa	tgatcctatc	240
tctaaattaa	ggatttaata	aatgctgcaa	attgtccact	ttgcaaattg	tccaaaagct	300

<210> 167

<211> 300

<212> DNA

<213> Homo sapiens

<400> 167

gcgagatgaa gctacactgt gaggtggagg tgatcagccg gcacttgccc gccttggggc	60
ttaggaaccg gggcaagggc gtccgagccg tgttgagcct ctgtcagcag acttccagga	120
gtcagccgcc ggtccgagcc ttcctgctca tctccacct gaaggacaag cgcgggaccc	180
gctatgagct aagggagaac attgagcaat tcttcaccaa atttgtagat gaggggaaag	240
ccactgttcg gttaaaggag cctcctgtgg atatctgtct aagtaaggat tccatatggc	300

<210> 168

<211> 300

<212> DNA

<213> Homo sapiens

<400> 168

gtctgggagc cctacgcttt ccggataaaa atggcagaat gaaagaatta tgagtggaaac	60
tagagaatag gaaagacatg aaccaacgcc caaaatgaga aagaaggaca tataaagaaa	120
aagacaaata caagtgaaaa aaatatacta atggattaac gtccctgtcg agtgacattt	180
tctgactatg gaaatgatat tagacaaaaa gcaacttcaa gtgggtttct tatttgagtt	240
caaaatgggt cataacgcag catagataac ttgaaacatg aacagcgcat ttggcccagg	300

<210> 169

<211> 296

<212> DNA

<213> Homo sapiens

<400> 169

gagatctctg ggatgtcagt gaggttggtt gaagaccaga ggtaaactgc ggaggtcacc	60
accctcacca tgtcccagggt gatgtccagc ccactgctgg caggaggcca tgctgtcagc	120
ttggcgctt gtgatgagcc caggaggacc ctgcaccag caccagccc cagcctgcca	180
ccccagtgtt cttactacac cacggaaggc tggggagccc aagccctgat ggccccgtgc	240
cctncattgg gncacctggc tanttcancn agnccncag gtnagncca aagcca	296

<210> 170

<211> 300

<212> DNA

<213> Homo sapiens

<400> 170

gggtgttggg gcagattgta gttgatccac agcaaagagc atcaccaaag ccattccagg	60
aggaactaga tccaccactt cctctgctgg gcatgctcca aaaatggttg tggcttccag	120
agaggactcc aaaagaaagc acaaaaacta gacagtggga gggcataccc aaaagccctg	180
agtttctgaa aaaatattga aagtttctat ggtgaaatag gaagttaatg tgcttaggaa	240
gaaaaaagtg gtaatgatc aaggaaacat aatcacacac ggtttttagtt ttaatggaca	300

<210> 171

<211> 300

<212> DNA

<213> Homo sapiens

<400> 171

atggaggcac cagcaggtag tggccccctgt aagcagggcc agagtcggga caaagagcag	60
gagtgaagca gccaagagac agaggaccag gctggagcca gtgggcacgc aggagcctgc	120
ctgggaaaaa cgggggggca aggctggcat gggaaatgaac acctgctggt gacacctctc	180

tgagcttcag ttcccttaac tagaaaaata gaacaggccc ggtgcggtgg ctcatacctg 240
 taatcccagc actttgggag gctgaggcgg gtggatcatg aggtcaggag atcaagacca 300

<210> 172
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 172
 ggcggaggag cagaagctca agctggagcg gctcatgaag aaccgggaca aagcagttcc 60
 aattccagag aaaatgagtg aatgggcacc tcgacctccc ccagaatttg tccgagatgt 120
 catgggttca agtgctgggg ccggcagtg agagttccac gtgtacagac atctgcgccg 180
 gagagaatat cagcgacagg actacatgga tgccatggct gagaagcaaa aattggatgc 240
 agagtttcag aaaagactgg aaaagaataa aattgctgca gaggagcaga ccgcaaagcg 300

<210> 173
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 173
 gtctttccca ttcacttctc tagaaagctg ccaagacaga ggcagaaaga aatggatgat 60
 agttctgtca agcacacttc tgttctctta gaacttagaa gtgtttctaa gagaacagaa 120
 gtaataagag aaacagttac gtgtggaatt caacatcttt ggttggaaacg cattggcttt 180
 tttttcttgg ttttgataga aatggaatta agcaaaagta gtttttgtct tttctgttgt 240
 cttcaaatth caggccatct atttttaatt taatcccgtt caagtacttg attgttatac 300

<210> 174
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 174
 attatttcca aagcagccta cagtagaaaa tagtcattat ggcagcagct tctgatgttt 60
 ttgtttggta ggttttctga tttcaatata tagaatcata ttcataagat atcttctttt 120
 aacgaattgc acaaagtacc catttaaaat ttacatgcac agttcattgc cacctttctt 180
 aggcctatgc atagttaata aggttataat ctactcaaca tggaaaatgg agcctatttg 240
 caaacacaca agtaattaaa gtaccaattc tctcttagtt tcttttttta tagttggttt 300

<210> 175
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 175
 tgganactct ttantatgga aggtgaattt cctgtcaaca tagtccagga caaagcagtt 60
 ccaattccag agaaaatgag tgaatgggca cctcgacctc cccagaatt tgtccgagat 120
 gtcattgggt caagtgtctg gcccggcagt ggagagttcc acgtgtacag acatctgcgc 180
 cggagagaat atcagcgaca ggactacatg gatgccatgg ctgagaagca aaaattggat 240
 gcagagtttc agaaaagact ggaagaagaat aaaattgctg cagaggagca gaccgcaaag 300

<210> 176
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 176
 tataaaacttt attttattct cttctggggg agagttacat gacaagaaat tgaattaatt 60
 caataaaaatt ttagttcggg ttgcttaggt ttttactgct ccatttcttg cttttactaa 120
 tttatccaag attagatgtg attactatct aataataatt tagtcctcac acttacaaac 180
 cacttacaat accagcatgc ttctatcact gtaattctat tcaattctca ggcccatgag 240
 gcatgccagc cagacgacca gacagcattt atagagaggg cactcaatac cagccacaaa 300

<210> 177
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 177
 gactggagaa gtcagaagta gaaaagcaga ttgctaggag agacaggatg acagattttg 60
 gtcagaaaat gggatattgg agtttaaagt atcaaataca gaatagttcc agatgttcag 120
 agatccagca tgggattagg tactgaaatg gattagaact aaaagtcact agaatttaga 180
 aattgagaac catgagagtg gatgcaatga cttgttgctt gattgaaaaa taaattaata 240
 ataataaagg accatgagac tagcctgtta taggggggtat ctccatgann nttgtttttc 300

<210> 178
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 178
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 gagtctgtgt tgcacagtaa tatcctgggt caggtaaaat ccaggctctc aagttttaag 120
 gattttttga agaattcggg cttctttaag acgatccatg cccaaatcca caagcttggt 180
 gacagtggat tacagtttgt gtggcaaagt ccaagttggt acactgtgct ttaaaaaaaa 240
 tcttatctgc atgtattgtt aacttagaga ccatgagatc tatttatcag gaccaggaag 300

<210> 179
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 179
 ctcatgcctg taatcccagc actttgggaa gcagaggtgg caggatcatt ccagcccagg 60
 agttcaagac cagcctgggc aacacagtga gtgagaccct gtctctatct aagaaaaaat 120
 aattaagaaa ttttattaaa aaagaagaat caggaaacca agtccaaccc aactaaacct 180
 caaatgaacc agcccctaac acagatgagg ggatttggga ctgataagct ctgtgctgtg 240
 tccatggccc gtcatttatc aaggctgcag ctttgtaaat gtggctatct ttatgttgtg 300

<210> 180
 <211> 300
 <212> DNA

<213> Homo sapiens

<400> 180

gtgatctgcc	tgccttggtc	tcccaaagtg	ctgggaatac	aggcatgagc	caccgcactc	60
ggccaggagc	tagttttatc	agcatcctgc	tccactgctt	tcctctagtg	cagcctggaa	120
gacatggcag	cgggtagctc	ctggggctga	gccagaagca	tcactgcagt	gaaagtctct	180
gcttacctgt	ctggctcagc	ttgggcaagg	gctgggccat	atgtgctcag	ggacgtgctt	240
ctcttctaag	gcaggaggat	agaagaggac	caagaaggga	gggagctgcc	ctgtggtgca	300

<210> 181

<211> 300

<212> DNA

<213> Homo sapiens

<400> 181

cccatgccgg	gatcttccca	caccgcctct	cacagatcca	gccccagccc	cttgcctccc	60
aggccatctc	tcagcagcac	ctgcaggatg	cgggcacccg	ggagtggagc	cctcagaacg	120
catccatgtc	ggagtctctc	tccatcccag	cttccctgaa	cgacgcggct	ttggtcaga	180
tgaacagtga	ggtgcagctc	ctgactgaaa	aggccctgat	ggagcttggg	ggtgggaagc	240
cgcttccgca	cccccgggcg	tggttcgtct	ccttggatgg	cagggtccaac	gctcacgtta	300

<210> 182

<211> 300

<212> DNA

<213> Homo sapiens

<400> 182

tttgcagtgt	tgtcagaaac	aaataataaa	gccccaaaag	attaactagt	tgaaaaaact	60
ggcaaaatct	gtatacgtgg	aaatttacca	ggacagagac	tgaagaataa	agaaaatgag	120
tttcattgcc	agatcatgaa	atccaaagaa	actttaaaga	agatgagttg	tgtaaattgga	180
actgaaggga	gggaagagct	gccttcgcct	gggacaaaga	aaacatgtgt	atacacatgg	240
gtcaagcagt	gctggtctgt	ggctgcctgt	ccagaggaat	ggaaatatcc	cttgtcttta	300

<210> 183

<211> 300

<212> DNA

<213> Homo sapiens

<400> 183

cggacccatc	ggagcgtaac	ctggatctcc	gcaggcctgg	cggaggccgg	ccacctggag	60
gggcattgct	tggttcgcgt	ggtagcagag	gagcttgaga	atgttcgcat	cttaccacat	120
acagttcttt	acatggctga	ttcagaaact	ttcattagtc	tggaagagtg	tcgtggccat	180
aagagagcaa	ggaaaagaac	tagtatggaa	acagcacttg	cccttgagaa	gctattcccc	240
aaacaatgcc	aagtccttgg	gattgtgacc	ccaggaattg	tagtgactcc	aatgggatca	300

<210> 184

<211> 300

<212> DNA

<213> Homo sapiens

<400> 184

ctgttttgca	gatgaggaaa	ctgaggtaca	gaattcttag	ggaacttacc	caaaatggct	60
tttctgcact	ctgccctttg	gtattgtccc	atgtgaattg	tttaaaactt	atgtgtatag	120
tggcatgagt	aggtgatttc	agaaacagaa	ctcacttttg	ttgtttggtc	ttaaaattag	180
gaacttttct	tcactctggc	ttcatttccc	tgcaccttcc	cagctttcta	gtcatgcaag	240
ccacatgtct	ccacgtgagg	ggttcattgg	aaagcagcca	cagagccacc	ccctggctgg	300

<210> 185

<211> 260

<212> DNA

<213> Homo sapiens

<400> 185

attatagaga	ttaatctcct	ttgctcgaag	tctattttaa	tattagtcac	atctaaaaca	60
tacttttaca	gcaacatcta	gactgggtgt	tgaccaaaca	actgggcac	atagctgaca	120
cataaaatta	accatcacaa	ccatgttcta	ggcactgttc	ctcactgcct	gagaagacac	180
cgttatgttt	attaggggtt	ttgagtttta	tccacagctt	ttgggttatct	gcaaccatgt	240
ctccacacct	taacatagtt					260

<210> 186

<211> 300

<212> DNA

<213> Homo sapiens

<400> 186

gataaactct	tcagtgcga	atattagaaa	aagttagtta	tacatttgag	gaaaactata	60
aaagtaccaa	taatgagtag	gaaatcactt	ctgcagtatt	tttgagcat	tttccttaag	120
catgacataa	aagccaaagg	tcacaaggga	aaaaactgat	agatttgtct	gtgatattga	180
gagatgtatg	cacatatata	tacaacagtc	atagtaagac	accgttagac	aaaaggtgat	240
gtatgaaaaa	gaggcaaaac	aacaagaaga	aaagattgaa	aaaatgagag	ctgaagacgg	300

<210> 187

<211> 300

<212> DNA

<213> Homo sapiens

<400> 187

aaaaagtaaa	gcttttcatg	agcaciaaat	ccttgcattg	tttgatgtta	ctgatattcg	60
taaaatgaat	attttttggt	ttgttttggt	ttattttttt	gagacaagtc	ttgctttggt	120
gcccaggctg	gagtgcattg	gcatgatctt	ggctcactgc	aaccctgccc	ttgcgagttc	180
aagtgattct	tctgctcag	cctcctgagt	agctgggatt	acaggcgctc	accaccacac	240
ccagctaatt	tctgtatttt	tagtagacac	agggttttac	catgttgccc	angctgtctt	300

<210> 188

<211> 300

<212> DNA

<213> Homo sapiens

<400> 188

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gcatgctctg	atggcactgt	aaagatctgg	aatatgaaga	ccacagaatg	ttcaaatacc	120
tttaaattccc	tgggcagcac	cgcagggaca	gatattaccg	tcaacagtgt	gattctactt	180

cctaaaaacc ctgagcactt tgtggtgtgc aacagatcaa acacggtggt catcatgaac 240
atgcagggggc agattgtcag aagcttcagt tctggtaaaa gagaagggtg ggactttgtt 300

<210> 189

<211> 300

<212> DNA

<213> Homo sapiens

<400> 189

ctaatatcca gaatctacaa agaactcaac aagaaaaaaa ccaacccac aagcgggcaa 60
aggacatgaa cagacatttc ccaaaagaag acatacaagc aacctaaaat aatctaaaat 120
aatttttaaa aagaaaaaat gcttgacaga gttttgatag tacttagtaa aaagttatat 180
ctagtggctt tttgtttgtt tgtttttgtt ttgtttttaa gaaatagtct ctgtttccca 240
agctggagta cagtggcgca atcttggtc actgcaacct cgaactcctg ggctcaagcg 300

<210> 190

<211> 300

<212> DNA

<213> Homo sapiens

<400> 190

aaccactatg gaggcattgat tgggtggccac tacactgcct gtgcacgcct gcccaatgat 60
cgtagcagtc agcgagtgta cgtgggctgg cgcttggttg atgacagcac agtgacaacg 120
gtagacgaga gccaggttgt gacgcgttat gcctatgtac tcttctaccg ccggcggaac 180
tctcctgtgg agaggccccc cagggcaggt cactctgagc accacccaga cctaggccct 240
gcagctgagg ctgctgccag ccagggacta ggccttgcc aggccccga ggtggcccca 300

<210> 191

<211> 300

<212> DNA

<213> Homo sapiens

<400> 191

gcggcgctga cccggccggc cccacaccg ctcttcctct tctttgccgc ggactccctt 60
tcctgcctcc aagacctggt gtctccact gtgagccag ctgtcccaca ggagtcctcc 120
atggacctag actcaccttc cccttgcttc tatgaacctc tgctgggccc agccccgtgc 180
ccagctcccg acctgcactt cctgctggac tcaggcctcc agctccctgc ccagcgagcg 240
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<210> 192

<211> 300

<212> DNA

<213> Homo sapiens

<400> 192

gacagaccgt tgagaggacg tggaggcccg agagggggta tgcgcggcag aggcagaggt 60
ggccctggga acagagtttt tgacgctttt gaccagagag gaaagcgaga atttgaaaga 120
tatggtggga atgacaaaat agcagtcaga actgaagaca acatgggtgg atgtggagtt 180
cgaacctggg gatcgggtaa agataccagt gatgtggagc caactgcacc gatggaggaa 240
cccacagtgg tggaggagtc ccagggcacc ccggaagagg agtctccagc caaagttcct 300

<210> 193
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 193
 ctcaagaaag gagaagtttt tttgtatgaa attggaggaa atattgggga acgctgcctt 60
 gatgatgaca cttacatgaa ggattttatat cagcttaacc caaatgctga gtgggttata 120
 aagtcaaagc cattgtagaa gacttaacaa gctgcagata accatgtgga cttctgtcat 180
 aattcttgct gagtcaagag tgtaaataaa agaaatggca ggactcatat tattcagttg 240
 tacccaagta tttaaaaatg actctcttaa gccttaaaaa gtcatagatt tgtgctgctg 300

<210> 194
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 194
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 ttgtataaag taattttcag tgattttttt catgggtatg ataaaagaac tggattagca 120
 gaaactttta ccctgaatca agatttaatt tttctttgag ctcatcttaa ggatatcgga 180
 acatagggag caaacgatgg tgtggctgcc tcagtgtctg atttttaacg gttttgaaga 240
 gaatagttac atttcttctc ctagtaagaa ctaataaata cattaacaga aatgaattcc 300

<210> 195
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 195
 ctctactaaa aatacaaaaa ttagctgggc gtggtggcac acacctgtaa tcccagttac 60
 ttgggaggct gaggcacaag aatcgcttga acccgggagg cggagggtgc agttagccaa 120
 gatcgccctg ctgcactcca gcctgggcaa cagagggaga ctctgtctcc aaaaacaaaa 180
 acaaaaactg ttagtgaagg ttccctggga cttttgatat tttaaaaatt gatcttatga 240
 ctaagtagat aaattcattg ccataatgag gctagctccc agataaacag cgtattttct 300

<210> 196
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 196
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 tgcttattaa aattttgtta attttagcaa agaccaattg ttgtgataaa ctggtgtttt 120
 ttggatgctt caagcacacg ttaaccaatt ttttaattcc ctttttggtt cctcccattg 180
 ttctaaaata ggactttcat attattaaaa cctcaaaaga tgatccaccc aggatgaaca 240
 aagatcacca aggggaaaga aaacattttt tatctttaca gaaaacatgt taagattata 300

<210> 197
 <211> 300
 <212> DNA

<213> Homo sapiens

<400> 197

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tttggtctaga	tcaaaagccg	agccacctaa	acaacagtcc	agcccccttag	taaacaaaga	120
ggaagagcat	gcaccagaat	catccgcaaa	tcagacagtc	aacaaagatg	tggaacgcaca	180
ggctgaagga	gaagggagcc	gcccatccat	ggacttatct	agggccatct	ttgccagtgc	240
ctcagatgaa	aagtcctcat	cctccgagga	tgagcaaggt	gacagtgaag	atgatcaggc	300

<210> 198

<211> 300

<212> DNA

<213> Homo sapiens

<400> 198

gcaacatttg	tctacaactc	tactgtaaaa	ttggaaatgc	ttttccacag	aaaaacctct	60
caaaatgctg	aatgcaaaag	ttgggatcac	agaaacattg	tgctattttt	tggtctgctg	120
gaaactgtat	ttttacaagg	taatccctgt	tttcaatata	gttctgtctt	tgccactggc	180
ggttttcttg	tagcattttt	ctagtcttga	gattgctact	acccaaagta	ttcatttctt	240
tcttactggg	gtgtcctctg	tcttcacagc	ctgcttctgg	attgtaggtt	ttttcctttc	300

<210> 199

<211> 300

<212> DNA

<213> Homo sapiens

<400> 199

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caaaatgctg	aatgcaaaag	ttgggatcac	agaaacattg	tgctattttt	tggtctgctg	120
gaaactgtat	ttttacaagg	taatccctgt	tttcaatata	gttctgtctt	tgccactggc	180
ggttttcttg	tagcattttt	ctagtcttga	gattgctact	acccaaagta	ttcatttctt	240
tcttactggg	gtgtcctctg	tcttcacagc	ctgcttctgg	attgtaggtt	ttttcctttc	300

<210> 200

<211> 300

<212> DNA

<213> Homo sapiens

<400> 200

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agtagccaaa	gaagctgcta	acagatggac	tgataacata	ttcgcaataa	aatcttgggc	120
caaaagaaaa	tttgggtttg	aagaaaataa	aattgataga	acttttggaa	ttccagaaga	180
ctttgactac	atagactaaa	atattccatg	gtggtgaagg	atgtacaagc	ttgtgaatat	240
gtaaatttta	aactattatc	taactaagtg	tactgaattg	tcgtttgccc	tgtaactgtg	300

<210> 201

<211> 300

<212> DNA

<213> Homo sapiens

<400> 201

ttctactttg	ggtccgcgcg	aagcccactc	acgtgtgata	tgtgttgccc	ctctcggtgg	60
ttccaggcga	tccagccatg	ccccctgcc	ctctgccag	atgcttcagg	ggcccggctt	120
ttcaggcttg	ccctcaccag	cggccgtcag	cgcacactca	gggatgtagc	taacaccact	180
ccgccagtgc	tttcagtagg	aagagctgag	gtgcctggg	aggcccgggg	cgaccggaaa	240
agggctctct	caagttctga	aaagagaatc	tgccaccaga	tcgaatttcg	accctgagc	300

<210> 202

<211> 281

<212> DNA

<213> Homo sapiens

<400> 202

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tgaagatatt	ttgagcaaaa	gtaacctgaa	cccagatgcc	aaggagttaa	ttccaggaga	120
gaagtactga	gccgagaaa	ctttgaggaa	gacttgtctg	tccccacatc	tggggatagt	180
aatgcccata	atggtggagc	tgaagagggg	gatggggcgg	gagaggggtg	cacagcggga	240
aggggagtgg	tggtctcacg	atactgtgac	tctgagtaac	t		281

<210> 203

<211> 300

<212> DNA

<213> Homo sapiens

<400> 203

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cctccacct	cctccctcag	cccctcattc	tccttgggaa	tctgcagagg	gctctgggac	120
tactgcgag	atgtgaaatc	caggcgtcag	ctgtttccta	ggcaagggca	ggaaagtgg	180
ctccagccct	tgtccactc	atgcctgggg	gcctggggct	gagtggatc	cctacctggc	240
ctccccctgg	cctctgggac	tccagcgtcg	ggtttgtcga	gtgagagaga	gagaggagct	300

<210> 204

<211> 269

<212> DNA

<213> Homo sapiens

<400> 204

gcggactctc	aggacgaaaa	gagccaaacc	tttttgggaa	aatcagagga	agtaactgga	60
aagcaagaag	atcatggtat	aaaggagaaa	ggggtccag	tcagcgggca	ggaggcgaaa	120
gagccagaga	gttgggatgg	gggcaggctg	ggggcattgg	gaagagcgag	gagcagggaa	180
gaggagaatg	agcatcatgg	gccttcaatg	cccgtctga	tagccctga	ggactctcct	240
cactgtgacc	tgtttcagga	gcctcatat				269

<210> 205

<211> 300

<212> DNA

<213> Homo sapiens

<400> 205

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ttccaggcga	tccagccatg	ccccctgcc	ctctgccag	atgcttcagg	ggcccggctt	120
ttcaggcttg	ccctcaccag	cggccgtcag	cgcacactca	gggatgtagc	taacaccact	180

ccgccagtgc tttcagtagg aagagctgag gctgcctggg aggcccggg cgaccggaaa 240
 agggctctct caagttctga aaagagaatc tgccaccaga tcgaatttcg acccctgagc 300

<210> 206
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 206
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 cttggattat gcttctgata cgctataatt atttatgtac atgttatttt tcttcaatag 120
 actgtgaact cttcgaatgt aggactccta gagctagata ctcaattatt ttttattaaa 180
 ttgaatgact tgaaactaca gatcctttat ttaaacttcc caaatttctg ctttatctag 240
 gcaactcttt aaattctttg atctcatgta gattccaaag gctgaaataa ttgagatttt 300

<210> 207
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 207
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 tgctcgccgt gcgcgtgggc aactgctct acgacctggg caccgagaag atgttcgccg 120
 aggaggaggc tgagctgacc caggagatgt cccagagaa gctgcagcag tctcgccagg 180
 tacacctcct gccaggcctg tgggaacagg gctggtgcga gatcacggcc cacctcctgg 240
 cgctgccga gcatgatgcc cgtgagaagg tgctgcagac actgggcgtc ctctgacca 300

<210> 208
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 208
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 attaaaacag tttagtagcc ttcagttttg tgaaaatagt tttcagcaca gaaactgact 120
 tctttagaca aagttttaac caatgatggg gtttgcttct aggatataca ctttaaaaga 180
 actcactgtc ccagtgggtg tcattgatgg ctttagtaa attggagctg cttaatcata 240
 ttgatatcta atttctttta accacaatga attgtcctta attaccaaca gtgaagcact 300

<210> 209
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 209
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 gccactgatg gagatgcggc tccgggatgc gcctcagcac ttctatgcag cactgctgca 120
 gctgggcctc aagtacctct ttatccttgg tattcagatt ctggcctgtg ccttggcagc 180
 ctccatcctt cgcaggcctc tcattggtctg gaaagtgttt gccctaagt tcataattga 240
 ggctgtgggc ttcattgtga gcagcgtggg acttctcctg ggcatagctt tgggtgatgag 300

<210> 210
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 210
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 acgtcatggc cctgctataa ggtagtagtt ctagaagact gtttatctaa taattcagac 120
 taaagctatt tatattgctg tgacaccacg tggaaaactt ttataattcc atcttatttc 180
 tgatgtatat gttttatttt ctctgccttc ataagaacta aaaaccaaag ttatttacgt 240
 gaaaacaaga tttttgtttg agttcattta cttgagatat gtttaaaaaa tccaccttct 300

<210> 211
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 211
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 cttgtggaag aacagaatgc agagaaggcg aggaaagccg aagagatgag gcggcagcag 120
 aagctaaagc aggccaaact ggtggagcag tacagagaac agagctggat gactatggcc 180
 aatttgagga aagagctcca ggagatggag gcacggtagc agaaggagtt tggagatgga 240
 tcggatgaaa atgaaatgga agaacatgaa ctcaaagatg aggaggatgg taaagacagt 300

<210> 212
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 212
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 tgtcgccctt gctgcgagcc cacacgccc tccacatggc tgcctcctc ctgcttcctt 120
 ggctcatggt gctcacaggc agagtgtctc tggcacagtt tgccttgcc ttcgtgacgg 180
 acacgtgcgt ggcgggtgcg ctgctgtgcg gggctgggct gctcttccat gggatgctgc 240
 tgctgcgggg ccagaccaca tgggagtggtg ctcgggggcca gcactcctat gacctgggtc 300

<210> 213
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 213
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 taattcatac aatgaatgta tttggaatac ttacatatta taaaataaac tatacctctt 120
 caagaggat cctgttctgt aagatcagat gtttttattg caggtcaata taatactgcc 180
 agagacagaa aataccccct tatcagtcctc ttagtgccctc tttctgtttg tggcatgggtg 240
 agaaaaccca tgctgaaaag attgtacttt gtgatcccaa tcagagggag gagctaactc 300

<210> 214
 <211> 300
 <212> DNA

<213> Homo sapiens

<400> 214

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tgtcagagcc	catatcaaca	actcagagaa	acatcaaaga	gtcttggaat	gtctgatggc	120
atgcaggagc	aaacccccag	aagaggaaga	acgaaagaaa	cgaggaagaa	agaggggaaga	180
caaagaggac	aagtcagaga	aagcagtga	agattatgaa	caggaaaagt	cttgggaaga	240
ctcagagaga	ttaaaaggaa	tcttagaacg	tggaaaagaa	gaattggctg	aagctgagat	300

<210> 215

<211> 300

<212> DNA

<213> Homo sapiens

<400> 215

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atttcataac	aaaaatatgt	atctcttttt	tggtattttt	tcttgaaaac	ggtacatatt	120
ttagtatttg	tgcaaaaaaa	caagtcctaa	agtatttggt	tttatttgta	ccatccactt	180
gtgccttact	gtatcctgtg	tcatgtccaa	tcagttgtaa	acaatggcat	ctttgaacag	240
tgtgatgaga	ataggaatgt	ggtgttttaa	agcagtgttg	cattttaatc	agtaatctac	300

<210> 216

<211> 300

<212> DNA

<213> Homo sapiens

<400> 216

gcagatat	tttactgaaggaa	tctaggttgt	atcttcagtg	gacaatggga	ataaagcatt	60
tctaaagcac	cgactggaga	ggaaggcaac	agagacaagg	agagaagccg	agagacatgt	120
ctgcgtgctg	ccacgcacat	gagcgattgc	tctgtgaaga	gttgtaacct	gaacattttc	180
aggggaggct	gtttaccag	gcaatgtcct	caaacaagcc	tgtgccgggg	agtctggaa	240
tctgtgccag	gactgtgttt	ttagcccttc	acctctcagc	tttagcagga	catgaaccag	300

<210> 217

<211> 300

<212> DNA

<213> Homo sapiens

<400> 217

ccccatctt	cactgggttat	tccacttatt	taaaatgtcc	agaataagca	aatctccata	60
tagaggaagt	agattagtgg	ttgcttcggg	atgggaggaa	tgggaagatt	gaggtctttc	120
ttttgcagtg	ataaaaaatgt	cctaaaattg	actgtagcga	tggtcacaca	actctgaata	180
tgettaagac	cattgaatta	cacactttac	gttggtgaat	tgtatggtat	gtaaattata	240
gttcaataac	atagttacaa	aagataatca	aaagcatgaa	agcactgttg	atgtgggttg	300

<210> 218

<211> 300

<212> DNA

<213> Homo sapiens

<400> 218

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acggcctggg ggagcagctg tacgacctca ccctggagta cctgcacagc caggcacact    60
gcatcggtt cccggagctg gtgctgcctg tggtcctgca gctgaagtcg ttctccggg    120
agtgaagggt ggccaactac tgccggcagg tgcagcagct gcttgggaag gttcaggaga    180
actcggcata catctgcagc cgccgccaga gggtttcctt cggcgtctct gagcagcagg    240
cagtgaagc ctgggagaag ctgaccgggg aagaggggac acccttgacc ttgtactaca    300

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<210> 219

<211> 300

<212> DNA

<213> Homo sapiens

<400> 219

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caactagaga agattggaca gcaggctgac agagaacctg gagatgtagc tactccacca    60
cggaagagaa agaagatagt ggttgaagcc ccagcaaagg aaatggagaa ggtagaggag    120
atgccacata aaccacagaa agatgaagat ctgacacagg attatgaaga atggaaaaga    180
aaaattttgg aaaatgctgc cagtgtctca aaggctacag cagagtgatt tcagcttcca    240
aactggtata cattccaaac tgatagtaca ttgccatctc caggaagact tgacggcttt    300

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<210> 220

<211> 260

<212> DNA

<213> Homo sapiens

<400> 220

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ggtaagtcag gtgattgaat cccggaaagg ttcattgtct tcaagctcac aatactat    60
tgggacaaac agttgtctag tgtttggact catgaacctt gattcttgag ggtggtat    120
tactgctttt gtgatttggg ttcaacatat atagtctttt ctccggagtt accttaggtc    180
agtggccagt gtttcagccc ctggaaaggg catgggctgc cactgaggtt ggtcacaggc    240
ctctcagctc atggtgggag

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<210> 221

<211> 300

<212> DNA

<213> Homo sapiens

<400> 221

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gggttccatc ccttccaccc aggaaatgga ggcacgactt gcagcgttgc agggcagagt    60
tctaccttct caaaccccc agccggcaca tcacacaccg gacaccagga cccaagccca    120
gcagacacag gatctgctaa cgcagctggc agctgaggtg gctatcgatg aaagctggaa    180
aggaggaggc ccagtgaccc tccaggacta tcgcctccca gacagtgatg acgacgagga    240
tgaggagaca gccatccaaa gagtcttgca gcagctcact gaagaagctg ccctgatgag    300

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<210> 222

<211> 300

<212> DNA

<213> Homo sapiens

<400> 222

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gcggtgaccc acgtgtcctg catgattgcc ctactgctgt ggagacctcg tgctgaccat    60
ctggcagtggt tcttcgtatt ctctggcctg tggggcgctg cagatgccgt ctggcagaca    120
caaaacaatg ctctctacgg cgttctgttt gagaagagca aggaagctgc cttcgccaat    180

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taccgcctgt gggaggccct gggcttcgtc attgccttcg ggtacagcac gtttttgtgc 240
gtgcacgtca agctctacat tctgctgggg gtcctgagcc tgaccatggt ggccttatgg 300

<210> 223

<211> 300

<212> DNA

<213> Homo sapiens

<400> 223

gccccctctg gatcctgagc tccctgctct agacagtgat ggtgattcag atgatggcga 60
agatggtcga ggtgatgaga aacggaaaaa taaaggcact tcggacagct cctctggcaa 120
tgtatctgaa gggggaaagc cctcctgaca gccaggagga ctctttccag ggaagacaga 180
aatcaaaaga caaagctgcc actccaagaa aagatgggtc caaacgttct gtactgtcca 240
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<210> 224

<211> 300

<212> DNA

<213> Homo sapiens

<400> 224

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ccatggacgt tacgccccgg gagtctctca gtatcttggt agtggctgag tccgggtgggc 120
ataccactga gatcctgagg ctgcttgga gcttgaccaa tgcctactca cctagacatt 180
atgtcattgc tgacactgat gaaatgagtg ccaataaaat aaattctttt gaactatgat 240
cgagctgata gagaccctag taacatgtat accaaatact acattcaccg aattccaaga 300

<210> 225

<211> 300

<212> DNA

<213> Homo sapiens

<400> 225

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tgttggtagt tccctgctttt cttcttgga attcctcgtg gacctcgaga tctttaccct 120
aaaatagttc tgttgaattt caccctggca atgtaaattg atagcttatt ttcacagatg 180
ccagacaatg gacaactcac catcagtcct ctgctcacct gagacaaatg catgtctgat 240
tgcttcctct gccctattgt ttatgtgaaa atgcagattc actgagccag actaaggcat 300

<210> 226

<211> 300

<212> DNA

<213> Homo sapiens

<400> 226

tatataacaa cttttgcttt caaagttggg tgggactaga acacacaatg gaaggatgga 60
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gtcacttcct gccagcctgt ttccttacct acaagaggga gagacactcc ctggccagcc 180
tagttctcag ggtgaacgaa aggtcattat cactgcatcc tctagtcatt tgcttcttcg 240
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<210> 227
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 227
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 acaatgggag aggtcaggaa tcaagttcac tttcaagatc taagggagtc cactatctgt 180
 gcaattgtat ttggcttttt tttgactgtt ttcaatgctg gtaattgaaa ccattttaat 240
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<210> 228
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 228
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 ttgggcctca gcgaggatat catctcctca gagaagcctt ctgtgacat gctatctaaa 180
 atactccagc acttcagtca ccctttatcc cattactctg ctttttcaga aacattgggtg 240
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<210> 229
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 229
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 ggtaccatga tatatatgga gagtggcatt gtgaagataa catctttaga tggcatgca 180
 tacctctgcc tgcccagatc tcagcatgaa tttacagtac attttttgtg taaagttagc 240
 cagaagtcag actcatctgc agtgttgctc gaaacaaata ataaagcccc aaaagataaa 300

<210> 230
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 230
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 aatgttaagt ggaaaaatat acagtttggg aaaataaact agattctaca tttatttgtg 120
 ggtttttttc cctccttttc tttccacagc acttttgata tcaagcaagt ggcttccttt 180
 ttgagatatt aaaaaaaaaa agaaaaggaa aaaagtaaat gannnnnnnn nnnnnaaccc 240
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<210> 231
 <211> 300
 <212> DNA

<213> Homo sapiens

<400> 231

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ccactaatta	gactttttan	ntaaaaaang	taggggggtt	taaaactact	ttcctactac	120
caaaaaatca	naaagtatct	agctttctaa	atngggaaag	caagcaatgt	tataaaaaacn	180
ctgaagggaat	ctctttcttc	gggacctttt	gttaaactcg	gttnaagctg	taaaccttat	240
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<210> 232

<211> 300

<212> DNA

<213> Homo sapiens

<400> 232

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atggcctggg	gccccacct	gctgcagcag	gagccccaag	gagtgtctagc	tgaggggtgg	120
tgctgggggtg	gtcctcatgg	acagtggagg	gtgcaagggt	gcactgaggg	tggtgggagg	180
ggatcacctg	ggttccaggc	catccttgct	gagcatcttt	gagcctgcct	tccggtggga	240
gcagaaaagg	ccagaccctg	ctgagttaga	ggctgtctgg	atccactgtt	tccacacagc	300

<210> 233

<211> 300

<212> DNA

<213> Homo sapiens

<400> 233

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gcctggagct	gcaggtcccc	cggcatctct	ctctgtcccg	gcagcccagg	atggcctggg	120
gccccacct	gctgcagcag	gagccccaag	gagtgtctagc	tgaggggtgg	tgctgggggtg	180
gtcctcatgg	acagtggagg	gtgcaagggt	gcactgaggg	tggtgggagg	ggatcacctg	240
ggttccaggc	catccttgct	gagcatcttt	gagcctgcct	tccggtggga	gcagaaaagg	300

<210> 234

<211> 300

<212> DNA

<213> Homo sapiens

<400> 234

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attgagttag	gaggacaggc	agaactgtgt	ctgccaagga	ccggatgtac	ttctttcctt	180
gctcttggtt	ttttgtctac	ttttatatgt	aaggtattag	tacaaacctc	aaggagagaa	240
agtagaggat	cagatcattg	ggacttggtc	tggtttcaag	aaagaattaa	caaattgccg	300

<210> 235

<211> 300

<212> DNA

<213> Homo sapiens

<400> 235

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cattaaagg	tctattagct	ttctttccgt	ctgtctcaac	agctgagatg	gggccgcaa	120
ggagtgcctt	ccttttgctc	cctcctagct	gggagtgaac	gggtggagtg	tgtgtgcca	180
gggtgggggtg	tctcctggct	gggaaggagg	gaaaggagg	gagagtgttg	cgggggttg	240
cagtggagag	caggctggag	aggagatggc	taatagctgt	ttaatggaaa	cctgctgggc	300

<210> 236

<211> 300

<212> DNA

<213> Homo sapiens

<400> 236

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gatgccttct	aatgtctat	ctccagtatg	gtcttttcc	ttaagctcta	gatccattga	120
caccctcacc	atctctaaaa	ggcatttcaa	actgaacaca	tctgatacag	aacttttcat	180
ttccttccca	actttgcca	cgcagcctg	ctcctccttc	acgctttcca	cttagtatat	240
gatccacta	ttcactcagt	ctctgaagct	taaaacctag	gattcatcct	tgactactgt	300

<210> 237

<211> 300

<212> DNA

<213> Homo sapiens

<400> 237

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gacatatcgg	accaggaggc	cctggacgtc	ttcctgaact	ctggaggaga	agagaacact	180
gtgctgtccc	ccgccttagg	gcctgaatcc	agtacctgtc	agaatgagat	taccctccag	240
gttccaaatc	cctcagaatt	aagagccaag	ccaccttctt	cttctctccac	ctgcaccgac	300

<210> 238

<211> 300

<212> DNA

<213> Homo sapiens

<400> 238

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agtgaacgtg	gacatgctgg	agcagatgga	cctgatggac	atatcggacc	aggaggccct	120
ggacgtcttc	ctgaactctg	gaggagaaga	gaacactgtg	ctgtcccccg	ccttagggcc	180
tgaatccagt	acctgtcaga	atgagattac	cctccagggt	ccaaatccct	cagaattaag	240
agccaagcca	ccttcttctt	cctccacctg	caccgactcg	gccacccggg	acatcagtga	300

<210> 239

<211> 300

<212> DNA

<213> Homo sapiens

<400> 239

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aagaactggg	ggaacacagg	aacctagggg	aggaggggag	cgctgggcat	cctcaggctg	120
gcggccaagg	cctgcccctg	gaggcactag	aggagggcat	ctgtctgtgg	gagccagag	180

gctgcagggg	ggaggaggag	ggaggtatct	ggtgtgagcg	ttgccccctgc	gacatttggg	240
accacacagg	tgggcttcct	tattccctga	caaagcctct	gtttccagct	cttccgcct	300

<210> 240

<211> 274

<212> DNA

<213> Homo sapiens

<400> 240

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aaatgttttt	aatatacatt	cttatthttgt	cccacccctc	cagaaataag	ctggaaatct	120
taactthtttg	gggggtcttt	tttggtgttt	taatggggcc	agaactgtgg	tttaaatttt	180
tatgtatgta	ttttctthtt	tgtggagtat	aaatttaaaa	actggatttg	ggacctaaaa	240
tactcctcag	gttgatgtat	tcatgaaagt	ttha			274

<210> 241

<211> 300

<212> DNA

<213> Homo sapiens

<400> 241

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actgtccctt	acctgagtca	caatttgcgc	aaagccaaag	ggattgtcct	aagccaatgt	120
tgatttatca	ctcttcctgc	tcaaaagccc	ccaagatcac	ctatcaatca	cctacttgag	180
tgcaagcttt	gactctgtca	cctgacattc	aagtccccct	ctgcccccat	gccagtctta	240
tccctccccc	tacatatgcc	ctatgcctca	gtttgccttc	cctccacttt	aaaaagcctc	300

<210> 242

<211> 300

<212> DNA

<213> Homo sapiens

<400> 242

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agtttgccag	gcagctacag	ctctctgac	ctcagacggt	ggctgggtgc	tttggtact	120
tccagcagga	taccaaggg	ttgggtggact	tccgagatgt	ggcccttgca	ctagcagctc	180
tggtggggg	caggagcctg	gaagagctaa	ctcgtctggc	ctttgaggta	atgggggggtg	240
gcggtgggtg	ggggtgctta	gtggctatgc	tcaccccgct	ccaggaggcc	tattttggta	300

<210> 243

<211> 300

<212> DNA

<213> Homo sapiens

<400> 243

caagatctgg	aggaatgcag	agaggaactt	gatacagatg	aatatgaaga	aacccaaaag	60
gaaactctgg	agcaactaag	tgaattta	gattcactaa	agaaaattat	gtctggaaat	120
atgactttgg	tagatgaact	aagtgggaatg	cagctgggcta	ttcaggcagc	tatcagccag	180
gcctttaaaa	ccccagaggt	catcagattg	tttgcaaaga	aacaaccagg	tcagcttcgg	240
acaaggttag	cagagatgga	tagagatctg	atggtaggaa	agctggaaag	agacctgtac	300

<210> 244
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 244
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 gattttggat gcatctatgc cttgagaaat gaatggtttg atgtaaatgc atggtagcaa 120
 gaataaataa ttatgttaat tcatataata tggtatatat agttttaaag aaaattctat 180
 cactgtcttc ctatgggtag ggctataatg tccagttcct tcagggatta agagggtagg 240
 gtctgaagtt aatccttggt tgcgtaatg ttattaattt attcaaccaa gacttaattg 300

<210> 245
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 245
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 tacgcggtct gtctttgaaa agttgtaatg cgccgcatga ctataaatac ctactgtggtt 120
 agcatttaca ttccttgcca gggagtttga aattttatact atagaaataa ctttaggttt 180
 taggtagagt taaagaggta aagcacatgt tgccacaacc caggaaagta tttttaagaa 240
 agattggatt ttcctacctt tagagatcta aaaaaattt aatataaaaa atcattttgt 300

<210> 246
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 246
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 ggtagtatag taaaaccaac cagctgaacc ttccaggcta caagagaacc cgggtcggtta 120
 atgtcttttt aagaataatt ttttaattgct tataacaagc atattttgtg gcatttgaac 180
 tatatttact gctccaatat ccgttatatt ccaaaggatt ttgtatcttt ttgaaaatgt 240
 ttacatcatc agatgatcca cagaattcac tttatgtgag atctcccag agtttccatc 300

<210> 247
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 247
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 gaagactgtc agaaagaaga ggagacaaaa caacaacaac ttcaagtgtc tcagaatgag 120
 attgaagaaa acaagctcaa actagtccaa caagaaatga tgtttcagag actccagaaa 180
 gagagagaaa gtgaagaaag caaattagaa accagtaaag tgacactgaa ggagcaacag 240
 caccagctgg aaaaggaatt aacagaccag aaaagcaaac tggaccaagt gctctcaaag 300

<210> 248
 <211> 300
 <212> DNA

<213> Homo sapiens

<400> 248

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tctctaaaca	aaacagttat	tgtttaaaga	atctgaaatc	ttcatcttta	attcaggtag	120
caatgaatcg	agcccaagtt	tgtttgatat	ccagttccaa	gtctggagag	aggcatcttt	180
atcttattaa	agtatcgaga	gacaaaatat	cagacagcaa	tgaccaagag	tcagcaaatt	240
gtgatgcaaa	agggctatca	aaggagggct	ttttacagag	aactaaggaa	gagaaggagg	300

<210> 249

<211> 300

<212> DNA

<213> Homo sapiens

<400> 249

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tgggtggctca	cacctgtagt	cctggctact	gaggaggctg	atgcaggaga	atcatttgaa	120
cccaggagggt	caaggctgca	gtgagctatg	attgcaccac	tgcaatccag	cctggacaac	180
acagtggagac	cctgcctcac	aaaaattata	ttctgatttt	ctgagtccat	gaacacattg	240
tccaaatgga	tttttctagc	tcctccaagt	tacagatagt	tccacgcaca	cacagaactc	300

<210> 250

<211> 300

<212> DNA

<213> Homo sapiens

<400> 250

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acaaggggacc	acaaggacgg	gggcagtctc	cagacttccc	ctgggcgctt	gaccccaggc	120
cttgacgggg	agagagccag	ggcctccctc	aggtctttgt	tcatgctggt	ttccctgccg	180
tggacaccct	ttcccgtctc	ccgattctct	aaatcctgcc	ccatctccca	gatcttggtc	240
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<210> 251

<211> 300

<212> DNA

<213> Homo sapiens

<400> 251

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cgagggaata	aaggagacat	aactcccctg	atggcagctt	ccagtggagg	ttacttagat	180
attgtgaaat	tattacttct	tcatgatgct	gatgtcaact	cccagtctgc	aacaggaaac	240
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<210> 252

<211> 300

<212> DNA

<213> Homo sapiens

<400> 252

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aaccgccgggt atttaccaca gacaacaaaa ccgcttcact atgatgtatg catgctgcaa      180
aggaagagac agaatcttgc tctatcaccc agctggagtg cagtggcacc attgcagctt      240
actgcagcct caaactcctg gctcaaggga tccttcagct tcagcctcct gggttaactag      300
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<210> 253

<211> 300

<212> DNA

<213> Homo sapiens

<400> 253

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gccactgcac tctagcctgg gcgacagagc aagactccgt ctcgaaagaa agaaagagaa      120
aggaaattcc ccagggaagt acctcggctt atttcataaa caggtactga aggaagcaga      180
ggcatgtgga ggacttcccc acctcgtgca gctatttggg ccgtggcatc tgaaatttct      240
tatttcagag tcaccctttt gatgaccttg gcagtgaact gcagtcattc gtttaggcct      300
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<210> 254

<211> 300

<212> DNA

<213> Homo sapiens

<400> 254

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taaagattat aaataaatgg tgatgttaaa gtaatagcac cattggacga agctagggaa      120
tcaacacttg acagaaagat acatattttt ttatacaaaa ctacatatat ttgagcaatc      180
aagtagtaga catagagaat tttcttttta tggaagtact ctaataagta aagggtgat      240
agaattatat cagcattttc tagctcctgg ggaattatgc attgggcatc catggctgct      300
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<210> 255

<211> 300

<212> DNA

<213> Homo sapiens

<400> 255

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aggggtgtca ttctgggctc ggggtggttg ccaatttttc accagaaagg gagccacccc      120
ttgcaaccac ttctgtctcc gttagccccc cctctgcctt cctccaagcc aaagcgtggc      180
ctggcttttg tcttccatt tagttttcct cttttaccct tccttttgtg cttaatttat      240
taaaatagtt gctgtataat ttattttcat aaactataaa aaaatactaa atgggttaaaa      300
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<210> 256

<211> 300

<212> DNA

<213> Homo sapiens

<400> 256

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acagtctcgg gtttcatatt ttgctgtttt tgatggacat ggaggaattc gagcctcaaa      60
atttgctgca cagaatttgc atcaaaactt aatcagaaaa tttcctaaag gagatgtaat      120
cagtgtagag aaaaccgtga agagatgcct ttggacact ttcaagcata ctgatgaaga      180
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gttccttaaa caagcttcca gccagaagcc tgcctggaaa gatgggtcca ctgccacgtg 240
 tgttctggct gtagacaaca ttctttatat tgccaacctc ggagatagtc gggcaatctt 300

<210> 257
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 257
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 atctgtggct ttttatagtt taaaataatt tctggaaaag tcatagtcac tatctcttta 120
 accgctccct ctcttcatt ctctttgttc tctcttcctc gaactcctgt tagtcatttg 180
 atcctccata tctctgaata tttttgtatt tcttttatta tttatttctt gtctctgcta 240
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<210> 258
 <211> 285
 <212> DNA
 <213> Homo sapiens

<400> 258
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 gaaccttgaa atgcatctgg ctagatttat gctcaaatca ttctcagtta gccttttagt 120
 gcctctcaa aggttttttt ttgtatgttt tctattctta ataaaagctt aggattaatt 180
 agaaagaatc tgatatgggt atgtttcccc ttgtgtacgc tgacctcatt catacgtttt 240
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<210> 259
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 259
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 ctctccctgt gaggacctgt ccagctggac ctccgccttc ctgcgactgt attggtgtct 120
 ttccctctca agcctatgag ctctgcaagg gcagggaccc tgtatgattt tgcctatcgt 180
 atgtcctcca gccccagca cagcgcttg tgtccagtga gagctcagca aatactttgt 240
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<210> 260
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 260
 gaaaagggag ccgcgcagcg cctacgggag tccggcggca gcagccggta ccggcaacca 60
 cgggcagctc tcagggaatc tccgtcgtga ggccagaggc tccagtcccc gcgagtccag 120
 atgcctgtcc agcctccaag caaagacaca gaagagatgg aagcagaggg tgattctgct 180
 gctgagatga atggggagga ggaagagagt gaggaggagc ggagcggcag ccagacagag 240
 tcagaagagg agagctccga gatggatgat gaggactatg agcgacgccg cagcgagtgt 300

<210> 261
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 261
 tttgctttca gtggttggct ttcaactgaaa gaaagtgtaa aaaaagtcag aatttatagc 60
 tttcaactatg tccaagacta ggactggggtt ataaagattt tcttttgtga aggaaaataa 120
 aagaaaattt gccactactg catttacttt actattgtaa acttaagatt cattccttag 180
 tcttttgaat tttgatgtct caaaaccaga tgagtggag tgctgaattt gcaaaataaa 240
 gctaagaatg cttaactctg cactttaagt tctactctga ccaaattgaa gatgagcaga 300

<210> 262
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 262
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 tgatcctcct gtgtagctgg gactacaagc atgtgccacc aatgcctggc ttctcacact 120
 gttttgtaac atagatatgt gaagatgtgt attatagaat tgtttgtaat actgtagtgt 180
 tgtaggcaat gtgactgtct ataggggaagt ggacagggtta tttgtggtaa atactcatgg 240
 aaaacgggtca agcagttaaa agcaatcaat tatgggtcacc cagcaatgca gataaatctt 300

<210> 263
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 263
 agaacagggga gaagagagga agagggagct gcagggtgcc aagagagaaca gggcgggactc 60
 tcaggacgaa aagagtcaaa cctttttggg aaaatcagag gaagtaactg gaaagcaaga 120
 agatcatggt ataaaggaga aaggggtccc agtcagcggg caggaggcga aagagccaga 180
 gagttgggat gggggcaggc tgggggcagt gggaagagcg aggagcaggg aagaggagaa 240
 tgagcatcat gggccttcaa tgcccgtct gatagcccct gaggactctc ctcaactgtga 300

<210> 264
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 264
 ttaaaggtag ttttagaagg aagtacaaat tggttttcat cttgcaaaca atcgtttttt 60
 acttcattat cttaatttgc tttgtcactc ataaaaagga aaccatacct gagttgtaga 120
 caatgaggaa acacttgagg cttctgctgt gtgttctttt gttattgttg ttattgttgt 180
 tactcagtaa cttgaatatt gtttaatgtg ttgtaagacg tagagtttat ctcaagctgt 240
 taaaaatggt aatgtacaaa tgtgaataga cacttatcta tataatatgg gtaagttttg 300

<210> 265
 <211> 300
 <212> DNA

<213> Homo sapiens

<400> 265

caggaaagtc	ttcctagagg	taatttttaa	gctgattgtt	ttagaattag	tagaagcttg	60
ccagatggaa	aagtccaggc	aaagtgtaac	atgaatggga	aaggccacag	tctagaaatg	120
gcagagtgtg	ttcctagttt	gtttgtttgt	ttgtttgtac	ctgccttggt	ccaggaagga	180
tttaatgtgg	tttatattcc	agtcctttaa	tgctggaagg	gctgagatga	gactgaaaga	240
tgggcaggaa	gtatatcatc	acaagctttg	tgtttgatgt	taatgtgtat	gatttttata	300

<210> 266

<211> 300

<212> DNA

<213> Homo sapiens

<400> 266

tgtgccacca	caccagctc	attattatta	ttattattat	tattattttg	agacgaagtt	60
tcactcttat	ccccaggct	ggagtgcaat	gggtgcgatac	tggtcactg	caacctctgc	120
ctcctgggtt	caagcgggtc	tcctgccttg	gcaggcacct	gtagtgtcag	ctactcgaag	180
gctgaggtgg	gagaatcgct	tgaacctggg	gggcggagat	tgcaatgggtg	tggtctcggc	240
tcactgcact	cgagcctggc	gacagagcaa	gactctgtct	caaaaaaaaa	aaaaaaaaaan	300

<210> 267

<211> 300

<212> DNA

<213> Homo sapiens

<400> 267

atataactct	ggaggtcagg	acataggaga	tattgattca	ggacttgcca	gagtatggtc	60
ttgggggtgtg	cctgatatt	acaaacaggg	atcttagtgg	ctaggtgatg	aggccatggc	120
aaatgtagat	ggaccaagat	caatttgcct	ttctagatga	ggttttctag	gtgaaatggt	180
tttgaaacta	ttttgtagcc	tagtataatt	tataaaagta	gagagaaact	ataaatataa	240
atttggaagg	ggttagctaa	aaggagaaaa	cagcagaatc	ttcatatata	tagaaatgga	300

<210> 268

<211> 300

<212> DNA

<213> Homo sapiens

<400> 268

cctacttatt	ggatgttggc	tctttggtgt	catggagatg	gctttactgt	aggtttgtgt	60
gtgttgcatt	acttttcatt	gggattgaac	tgagaaataa	caaacaagct	ttaagtggga	120
aattaaaaaa	aagaagtaac	ctatgtagat	ccaaacttaa	aatgtgagaa	attattgaaa	180
tttcattttc	tacaaacttg	aaattagcct	gctaattgta	aagttgtttt	aataatgctg	240
acaaatgtca	gttacgtttg	caaaggagtg	tatggttcta	ggtatttgcc	tactgttacc	300

<210> 269

<211> 300

<212> DNA

<213> Homo sapiens

<400> 269

cctacttatt	ggatgttggc	tctttggtgt	catggagatg	gctttactgt	aggtttgttg	60
tggtgcatta	cttttcattg	ggattgaact	gagaaataac	aaacaagctt	taagtgggaa	120
attaaaaaaa	agaagtaacc	tatgtagatc	caaacttaaa	atgtgagaaa	ttattgaaat	180
ttcattttct	acaaacttga	aattagcctg	ctaattgtaa	agttgtttta	ataatgctga	240
caaatgtcag	ttacgtttgc	aaaggagtgt	atggttctag	gtatttgcct	actgttaacc	300

<210> 270

<211> 300

<212> DNA

<213> Homo sapiens

<400> 270

cctacttatt	ggatgttggc	tctttggtgt	catggagatg	gctttactgt	aggtttgttg	60
tggtgcatta	cttttcattg	ggattgaact	gagaaataac	aaacaagctt	taagtgggaa	120
attaaaaaaa	agaagtaacc	tatgtagatc	caaacttaaa	atgtgagaaa	ttattgaaat	180
ttcattttct	acaaacttga	aattagcctg	ctaattgtaa	agttgtttta	ataatgctga	240
caaatgtcag	ttacgtttgc	aaaggagtgt	atggttctag	gtatttgcct	actgttaacc	300

<210> 271

<211> 300

<212> DNA

<213> Homo sapiens

<400> 271

ccacatttaa	gtgagatatg	ggaaggagga	gcagattggt	tttgaaggga	ggaagagcag	60
ttacttaggg	tcaaattaag	ttgtaaaatc	ccccccggga	ttttgtatgt	aagtcaaagt	120
gaattgtatt	tggaagaaga	actggggagc	ccacctctgg	tatttttttt	atgtccctca	180
tatggacaaa	taaacctctg	gtattaaatg	aattttcttt	tgggggatcc	tatatattcg	240
ggatttcaac	caccaaccta	tctggttttt	cccgtgaaa	tgttgggtga	tggaatcagg	300

<210> 272

<211> 300

<212> DNA

<213> Homo sapiens

<400> 272

gaacgcttcc	attttatacc	tgtgtctagt	tagtttctgc	ctatctatcc	aagaagcttt	60
tatcaagggt	ccaccatgtg	ccagccactg	aagtagatat	aaatacaagg	atgtgtaagg	120
tatggatgat	ggtatacgaa	ctgtcatctt	actggatttg	tccgctctgt	taaagatacg	180
gttccgaaaa	ctttttaaag	ccctagagag	ggctttaagg	caatgtagca	tcatatatag	240
aggcatcaac	ctgttcatat	ctttctattt	aacagaactg	tgcacctggg	cacaagggtg	300

<210> 273

<211> 300

<212> DNA

<213> Homo sapiens

<400> 273

gaatggcgtg	aacccgggag	gcagatggtc	ttaaagtggg	gagaccgggg	ttacaggcct	60
gactgcatca	ctaactcgct	gtgtgtccct	gggcaagtca	gtgcagtgca	gtagcctctc	120
cgtctccgac	tgaggagcaa	agccctcggc	tcaagatcct	cacctacttc	acagggattt	180

gaaatagtgc agtcaacagg aaaagaaaag cgctatagaa atgctcgacg ctatcacttg 240
 gggcccacgt ggaagtatca acgtataaat tggcccaggc agacagaagg atgcagggga 300

<210> 274
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 274
 ggaaccaggg gctgcagaac cagccccctcc ccaatgagga cccctctctgg acgccccctcc 60
 ccatggagaa caccaggagc cacagacccc agaccacagg agcacacagg ggagggcacg 120
 gggcgggcgg ggcaggggtgt ctgtgcctc gtttatggga tttgctccgc gtctagcaca 180
 ctgtgcctg cagtgtcct gtccccctgca gtggctactc tgggcctacg ggcctaatacc 240
 tggttggcat gaaaatgtcc tgaggctact gtgacaaatt tccacaagct gagtggctta 300

<210> 275
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 275
 ctttgggaag cagaggtggc aggatcattc cagcccagga gttcaagacc agcctgggca 60
 acacagttag tgagaccctg tctctattta agaaaaata attaagaaat tttattaaaa 120
 aagaagaatc aggaaaccaa gtccaaccca actaaacctc aaatgaacca gccctaaca 180
 cagatgaggg gatttgggac tgataagctc tgtgtgtgtt ccatggcccg tcatttatca 240
 aggctgcagc tttgtaaatg tggtattttt tatgttgtgt atagtttcta tcatttattt 300

<210> 276
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 276
 tttgtatttt tagtagagac aggggtttctt catgttggtc aggctggtct caaactccta 60
 acctcgtgat ccgcctgcct cgacctccca aagtgtctggg attacaggca tgagccacca 120
 tgcccagcca aagatcattt ttttatatag acttcagccc tttgtaaata ttgtaactgg 180
 ggagtataga gtagaaaaaa agtatagtta aaacatttgt tctacaaatt aacctttaaa 240
 aatataatta ctgctaaaaa tagagtgtct ttacacttaa ggaaaattag tgccattttg 300

<210> 277
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 277
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 gattgctgga tcccaccctt agactctctg attcagtttag tttggggtaa ggcgcaagac 120
 tgaatttttc acaagtttcc cagtgggtgt gatacttctg gtccaggaac ttagtgggag 180
 agaacgacta atctagacca tttcaattca cattctgagc ttcttgtaca ctgtcacact 240
 gcatcctttt aacaatgcat tccctatcct attgcaatac tgacatctca tcaatatttt 300

<210> 278
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 278
 ctgacaactt gattgggttc tccttcaggt ttgaagcgcc ctcgagaagt gtctaaagga 60
 gacagttgat agccaaacaa cagttttgga ttcactgact gattatgaaa gaagcagtag 120
 actggtatca agaatcagtc agcaaggagg ccctcaccag acgccagtgc catgttcttg 180
 gacttctcag cctccatatt catgaactaa gtttttgga tccttaggct tccacgtgtg 240
 gaaagcctga gctaacctac tggaggatga gccatcacct ggagcagatt caggccatcc 300

<210> 279
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 279
 ggtaaacccta tttatataat agaaggatga ttataaacat ttaataaatt atatcaaata 60
 gatattatat attaaatggg cagataatag aaatctgtcc aagcaaaact ctggataatt 120
 tttatgttgc cttatttttt gttttctgtg aactccaaga aaaatgagat accagtttgg 180
 aacagatgta atattgctga ttttaacagtt tagggatact cccaagtgc aataattttg 240
 ccaagataca aatttaaagtg gaacctttta tgaagcttca tagtgtgtga agaacttacc 300

<210> 280
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 280
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 tcaggcactg gaactatctg taatactgga acctctgcga agtgccaggt ataaagtttt 120
 tccactgccc aagcatccag agctttggga aatttggaaa tcagagagat cagggcattg 180
 ttttgttcct ctgatgatga aagtgaaaag caagtactac tgaagtctgg aaatataaaa 240
 gctgtgcttg gcctgacaaa gaggaggcta gttagtagca gtgggaccct ttctgatcaa 300

<210> 281
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 281
 caccatcgaa tatttttatt tattttgaga gacagactct gtcacccagg ctagtcttaa 60
 actgttggtg aatcttaagt gattctocca cctcagcctc ccaaagtgct gggattacag 120
 gcatgagcca ctacccttgg ctgtgatcaa gtatttagtc tgttggttaa tgtttactaa 180
 atagtctgaa gtagagaaaa tagcacccaa tctaaaataa ggtgaggtct agtcacttat 240
 ttaaatctac attttaagct atagtttact attagtttaa actttaagac aggtaatgtt 300

<210> 282
 <211> 300
 <212> DNA

<213> Homo sapiens

<400> 282

gcaaccttcg	cctcctgggt	tcaagtgatt	ctcctccctc	agcatcccaa	gtagctggga	60
ctacaggcac	gtgccaccac	acccagctaa	tttttgcatt	tttagtagag	gcagggtttc	120
atcatgttgg	ccaggctggg	ctcaaactcc	tgatctcaag	taatctgccc	actttggcct	180
cccaaagtgc	tggcattaca	ggaatggagc	caccgcgccc	agcctgattt	cttttttttag	240
gtcttgtcag	gaaagatatt	gattcctttt	attcgtgaac	atgggttttt	gtcgtcttta	300

<210> 283

<211> 300

<212> DNA

<213> Homo sapiens

<400> 283

cccaggtagc	tgagactacc	cacaccttgg	tcccagctac	ttgggaggct	gagggtggaa	60
aatcactttg	cccaggaatt	caaggccgca	gtgagctatg	attgcaccac	tgcactccag	120
gcaacagagt	gagaccctgt	cttaaaaaaa	gaaggagaaa	agtgtcagat	ggtgatgagg	180
tctggggggg	aaatagagaa	tggggatcag	gagtgtggat	ggtggtattc	cctcaccaag	240
aggtgacatg	tgagcaggga	gctgggaggt	gagggtgtga	cccgtgtgga	aatcagggaa	300

<210> 284

<211> 300

<212> DNA

<213> Homo sapiens

<400> 284

ggtgtcctcc	ccagtgcgcc	gcgatttttg	tgtccaagcc	ccagagtccc	tctgagacca	60
acccccagcc	agcacagact	tcctgccttc	ccagctcgga	agcgccctcg	agaagtgtct	120
aaaggagaca	gttgatagcc	aaacaacagt	tttggattca	ctgactgatt	atgaaagaag	180
cagtagactg	gtatcaagaa	tcagtccagg	ttttggaatc	cttaggcttc	cacgtgtgga	240
aagcctgagc	taacctactg	gaggatgagc	catcacctgg	agcagattca	ggccatccta	300

<210> 285

<211> 300

<212> DNA

<213> Homo sapiens

<400> 285

aattccgttg	ctgtcgggcc	gcatgtcat	tctggagaga	gacagagtaa	aacaaagaag	60
gtgatgggta	aagcgcagtc	gcctgctata	tattgtctat	ttttggtttt	tcacttacct	120
tttatattta	tgtcttttat	gtacaacagg	attataagta	gcttgagtcc	agtgaatata	180
ccatttcatt	ttgctatcct	tactgcact	tagcttagag	gaaataatca	cagcttatta	240
ttgattaatt	aattaattaa	tagatgaatg	gtgaacacat	gactatcatc	ccaagaaatg	300

<210> 286

<211> 300

<212> DNA

<213> Homo sapiens

<400> 286

agccaatgag	gcttttgcct	gccagcagtg	gacccaagcc	attcagcttt	acagcaagggc	60
tgtagagagg	gcccttcaca	atgccatgct	ttatggaaac	cgagcagcag	cctacatgaa	120
gcgcaagtgg	gatggtgacc	actatgatgc	cctgaggggac	tgccctcaagg	ccatctccct	180
aaacccatgc	cacctgaagg	cacactttcg	cctggcccgc	tgccctotttg	agctcaagta	240
tgtggctgaa	gccctggagt	gcctggacga	cttcaaaggg	aaattttccgg	agcaggccca	300

<210> 287

<211> 300

<212> DNA

<213> Homo sapiens

<400> 287

gggtgacaga	gtgaaactcg	tatctccaaa	caaacaaaca	aaaagtcctt	aaacatatgt	60
gaacaaaaat	tttgtgatgg	aaggattcta	gttaatgagt	attgcatcaa	gatttacatc	120
tttcttacta	aggaaaagag	ttaataaaaa	ttgttcttta	ttttacaggc	agttactgag	180
gctcttccca	gatctcagta	aacagccact	cagccttgaa	aatggagtg	tggtgtttct	240
aaacatatat	ttatgtcatt	tattaagtac	agttcactta	aataacataa	gtagattttc	300

<210> 288

<211> 300

<212> DNA

<213> Homo sapiens

<400> 288

accactaaca	gcactactt	gactactgat	actttgatca	tggagttagg	gcattgccact	60
tgatagaaat	ttgaagagca	attatatatt	tcaaaaagag	ttttgaataa	tgtaagata	120
gattgcaaca	tgactatcaa	ttcttccctt	cccatcaaag	gagagagtcc	gtttatccag	180
cctttgaatc	ttgattattc	aagtgacttg	cttcacccaa	tgtaacatta	ataagcacia	240
tacaagcaga	ggcttgccaa	gaacttggtt	tgtttctaat	gcttagaaga	agaatgggtg	300

<210> 289

<211> 300

<212> DNA

<213> Homo sapiens

<400> 289

tgtccttata	tgaaattcag	cgatcttcat	gaataagcat	ttctctgatt	gtggnatatg	60
cctttaattt	tatttctaga	tgacaaaatt	tttggttttg	acagtttttt	tctagcttta	120
tagtttcttc	ttggggagag	aatatgtcaa	cctcactcca	tcatgctgaa	gtaaatcttc	180
atctcttaat	tttatctctc	aaaaatatcc	taaggattcc	ctctggagcc	tgataagtaa	240
ttgcagtata	tggtttctat	ggttggtatg	ttcaggattc	caggaataat	agttactttt	300

<210> 290

<211> 300

<212> DNA

<213> Homo sapiens

<400> 290

ggaacatga	gaaccgaagc	tagaattgct	attgaattac	tttattttct	cttcccttat	60
tggttagaga	tacatcatta	ctggcctcag	gggtttaccc	aaagaaaggg	tatttttgag	120
caaataatgt	gatttcctgg	ctattttggt	gggggcttaa	gatttttttt	tttcaaagtc	180

atTTTTtagtc actaaaaatt aactgtcgtc ccatctagaa ctatactgtc cagtaccata 240
gcctctagcc gtatgtagct atttgtatta agattaatgg aaatttttaa tccagttcct 300

<210> 291
<211> 300
<212> DNA
<213> Homo sapiens

<400> 291
tatgatttta tttttggcct aatataggaa tgtttaaaaa aggcttttct atgaaaatta 60
gaaatttata cttgaaatta aaagtctaca agggggagga ccttaaagct aagctaccag 120
taagacaatg aataattcag aagagaacac tattctttta ctgactgagt gccaagatg 180
ccaatttcca tgaagtcttg atttatatat atgtacacat gttatgcaca tacatgtttg 240
ttttctaaca gttattcttt aagcttttga gataatttta gacttacaga agagttggaa 300

<210> 292
<211> 278
<212> DNA
<213> Homo sapiens

<400> 292
cccagaccta tggagtcaga cagtaggttt gagggccagc aatctatggt ttaacaagcc 60
atccagggtg ttctgatgca cagtgaaatt ggggtaccac tgggtattagg tttgggtatgg 120
caactttttc atcacttggt ttatgtagtt gtctgatcaa ttgtgaaaac ataatgaatg 180
ttggaaatgg aacagtaaaa taacgaaagc caactttttt tttttttttn nnnnnnnnnn 240
nntgnttttn cccccaggnt gnanngcagg gncccaat 278

<210> 293
<211> 297
<212> DNA
<213> Homo sapiens

<400> 293
ggaaggcagt gggaggagag gaccaagtct caaactccag aagccccacc tccctgagct 60
cagctcctct gccaaagccc ctcagcgcgga agtcctcgtc cagagaaggc aacggcgaga 120
aacaaatcca acatcctggg ctgctttttc cttccccac tttttaaaag tttgggtgtcc 180
aagtcacttg acaaaccag accctaacaa tgatattttg tgtagaattc tgggatcaaa 240
atataatttc aaaaataata tattttctga catcccccaa aaaaaaaaaa aaaaaaa 297

<210> 294
<211> 300
<212> DNA
<213> Homo sapiens

<400> 294
ggaacagttt gagcaaaggc tctcaagtaa taggggtgtc gacttgttca tttttgaaag 60
tagaactaat aggatttctt attggaacgt aggggtgtaag agaaaagagg agtcaaaaag 120
agccacaaga tttttggtct cagcaattag aaggatagaa ttgacattta ctgagatttt 180
tgtttttgtt tttgagacgg agtttcgcta ttgttgccca agctggcgtg caatggcgtg 240
atctcggctc agtgcaacct ccacctccca gattcaagcg attctcctgc ctcagcctcc 300

<210> 295
 <211> 299
 <212> DNA
 <213> Homo sapiens

<400> 295
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 actgtcacag aatggctggg ctgagaacgc tgcccagggc cctgcagctg gcgggagnnn 120
 nnnnnnnnnn nnnnnngtgcn tgctgcaaca tntggttana tngtatcctt ccctanagnt 180
 gctacnctt nnatcccctt gtnaatatgt tgagntnct tngcnttcnn gntnntccng 240
 ntnnttgaca cntatgnaan ttntntngtc tngctctgct ngatnncttn nangctgcc 299

<210> 296
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 296
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 ctactcaatc tgacttagta aaaccatgct gaaaaatctt ggtctaaaaa ggaccatac 120
 ccagcaccca tgaaataaaa gattcatctg taattgggat tcaaagggat taaattcctt 180
 tggtcatact cataaatagc actaaagtgt tataacattt tcatttacct atttttagtt 240
 ccttcatttt aacttaataa aaatcttgga ttgatattct tttttttttt ttttgggacg 300

<210> 297
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 297
 gctaggatta caggtgtgag ccaccatgcc cagccactta tctttaaagg attaagttta 60
 tgtttcctac tatgggaaac catcccacc caaacttgat gaccgcatta tgtgctttta 120
 tagaacatgg cacttctcca ggatagcatt tattctgttt tgtaagtgtg aatgtaatta 180
 ccctacacac agcatacaca taatcttcat attctttgcc ttgtcttggt aaggcaaggg 240
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 gtacacattt ggggtgcccc gggccctata cccagtggt ctctttgatc cagtcgccga 180
 acagaggag ccttgtgtac acgcctccaa agtgagctg ggaggtagaa ggggaggaca 240
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tcaaagccag	caagacttct	ctgctgctgt	gatctgcaca	ccctccaacc	tgggcaggga	180
ctggggggat	gcagtgtgtg	ttagtgccca	tgtggcattg	tggcactgtt	gcccccatg	240
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<213> Homo sapiens

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catcatcctt	catcatagcg	gcagcatccg	tcgtcacagc	ggcagcatcc	ttcgccacag	180
cggcagcatc	tgtcgtcaca	gcggcagcat	ccttcgcca	agcggcagca	tccttcgtca	240
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<210> 301

<211> 300

<212> DNA

<213> Homo sapiens

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ttacttcctg	gggcacctgg	tgttattggt	tggactagtc	aggattctcc	agagcagcag	180
aagcaatggg	atgtgtgtgc	atgtgtttgt	gcagagacag	aaagagagat	tttaaggaac	240
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<210> 302

<211> 300

<212> DNA

<213> Homo sapiens

<400> 302

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gaggtaactg	aatcatgggg	gctgggtctt	cccgtgctat	tctcgtgatg	gtgaagtctc	180
acgagatctg	atgggtttat	caggggtttc	cacttttgtt	tcttcatttt	ctcttgccac	240
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<212> DNA

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tagagtgttt gaggaacagc aaggaagcaa gcccttggtg aaacagattg agcaaggtag      180
aaagtggtaa aagatgaagt taaagaggta gctgagagcc agatcatgta aagccttggt      240
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<210> 304

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<212> DNA

<213> Homo sapiens

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tctatgcagt caccgaggag gagtccgacg aggaaggcag ccaggagaaa ggaggggacg      180
acagccagca gaagttcatt gtcacgtcc ctgtccctc gcagcaagag attgaggagg      240
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<210> 305

<211> 300

<212> DNA

<213> Homo sapiens

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aggcccatgc acacacacgt gcacacacat gcagagacat gcagacacgc aggcacacat      180
gcacacatgc aaagacacgc atgcaggcac acgcagacgc acacagagac acacatgcag      240
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<210> 306

<211> 300

<212> DNA

<213> Homo sapiens

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ggcagaaatc atcgacgatt gtgtgacaag tgaagaagaa gaagagttag aggaggagga      180
ggaggaggac ccggaagaag ataggaaatc cacaaaagaa gaagggagtg aggtgccgaa      240
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<210> 307

<211> 300

<212> DNA

<213> Homo sapiens

<400> 307

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tcaggtgttg ggaaatgggg acccgtctt ctggacacca gtagtccctg gtcccatgga      180

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accagatggc aaggatgagg aggaggagga ggaggannnn nnnnnnnnna ntggccttnt 240
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<210> 308
<211> 300
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<400> 308
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acatgtaaag tgcttagaat agattggtac tgtaaataat gagctaacgt cacatttgat 180
atTTTTTTaa aaagaaaaaa tcattatgga gtctcagtcc tagagattct gattcattaa 240
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<211> 300
<212> DNA
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<400> 309
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tacagctcaa caacgcccct ctgaaagtag gactcttggg aatgaacctt gttgggagta 180
aagctgaacc ttcacctctc ctttccagga ttctactcca ttcatacggc ctcacactga 240
attaatgggt ctagcagcca catcactttg ttaccaatt gatctagtag taaagtcttc 300

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tatcatgaga gcagctcagg aaacacccac tcccgatgatt cagttacatc ccaactgggtc 180
tgteccacaa attgtgggag ctacaattca agatgagggt tgggtgggga cacagccaaa 240
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<210> 311
<211> 300
<212> DNA
<213> Homo sapiens

<400> 311
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ctcttatgat atctacatac catctcatat tcagggcaat atcactctc atgctattgt 180
catcttgctt aaaacagatg gaatggaaat gcntgtttgc tatgaggatg anggggtgna 240
tgtaaacacc tatggccgga taacnaagga tgtggtgctc caatggggag aaatgcccac 300

<210> 312
 <211> 275
 <212> DNA
 <213> Homo sapiens

<400> 312
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 tntnnatttn ttccnttttt ttttnnnntn aaatatnntg nnnntttttt ntantantta 180
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 natntttttt ttgttcttct nttntattnn atctt 275

<210> 313
 <211> 300
 <212> DNA
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<400> 313
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 aagaggaaca cactggcaga agaacacatc gaaagacgct ggcaggccat tgatggtgga 180
 acgattcgga cgccaaggga aattcggccca aggacagtag gagatcccgg ctgctgagca 240
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 <211> 300
 <212> DNA
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 agcccttatc aggaacagac ttggctagca ccttcacgt ggacctccag cctccagaat 180
 tgcaagaaaa tacatttccg tcgttgaaac caccagtcgt gtggtatttt gttatggcag 240
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 <213> Homo sapiens

<400> 315
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 atggctggat ttgccgtggc cctgcccttg ctgttagata agcccaatgc ccaatttgat 180
 tccaccgctc cccggggcca cctggagagc agtcttctga gccacctgt ggatcccaag 240
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<210> 316
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 <212> DNA

<213> Homo sapiens

<400> 316

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aggggaatca	tgattataag	tccttcagcc	cttggactct	aaattgaggg	gattaaaaag	180
aatttataaat	aattttgaac	gaatttattt	tccctcagc	ttttgagggc	attaaaaagg	240
cattaaatca	agacaaatca	tgtgcttgag	aaaaataaaa	ttaatgaaaa	cacagcactt	300

<210> 317

<211> 295

<212> DNA

<213> Homo sapiens

<400> 317

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cctccagttc	ctgggttcaa	gccatccctc	ctgcctcagc	ctccccagta	gctggaacta	120
cagggtgtgtg	ccatcacacc	tggttttaca	tttttctgtg	gggaacttact	atgttgccca	180
ggccggcctc	aaactcctga	gctcaagtga	tcctctgcct	cagcctccag	agtatctggg	240
attacatatg	tcggctaccg	tgtctggccg	ttcacatctt	tgccactat	ttgct	295

<210> 318

<211> 261

<212> DNA

<213> Homo sapiens

<400> 318

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ggaaaggttg	aaaaggttta	taagaatggg	tgccgtgtta	tactgtttcc	caatggaact	120
cgaaaggaag	tgagtgcaga	tggaagacc	atcactgtca	ctttctttta	tggtgacgtg	180
aagcaggtca	tgccgaccca	agaannnnnn	nnnnnnnnnn	nnntngccnn	aacnnttcac	240
caaatncccc	gggggggctt	g				261

<210> 319

<211> 300

<212> DNA

<213> Homo sapiens

<400> 319

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gggtcggtgc	tgaggaggaa	tagtgaagga	gggaggcctc	tttgagttg	agataagagg	180
aaggcttctg	tctctgctt	gtccctggta	atggaatgtc	tcgggtgtaaa	gctgaccatt	240
cccattcggt	ctattctgag	ataggagaaa	accgccctgt	ggctggaggt	gagatatgct	300

<210> 320

<211> 289

<212> DNA

<213> Homo sapiens

<400> 320

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caagctcatg	ccccgctctt	gccagtgaca	cttgaagcct	cccgacttcc	acagagtgtc	120
tcaggacaca	ttttgagtgg	tattttcttt	tcttttttct	ttcttttttt	ttttnnnnnn	180
nnnnntngt	tntgtnnccc	aggctgnann	gcaggggcct	gatntnggnt	aantgnaacc	240
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<210> 321

<211> 300

<212> DNA

<213> Homo sapiens

<400> 321

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aagagaacgc	accagagaga	gagagaggga	gcgtgatcac	agtcctacac	caagtgtttt	120
caacagcgat	gaagaacgat	acagatacag	ggaatatgca	gaaagagggt	atgagcgtca	180
cagagcaagt	cgagaaaaag	aagaacgaca	tagagaaaga	cgacacaggg	agaaagagga	240
aaccagacat	aagtcttctc	gaagtaatat	tagacgtcgc	catgaaagtg	aagaaggaga	300

<210> 322

<211> 300

<212> DNA

<213> Homo sapiens

<400> 322

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gcccctcgcc	ttctcaacc	cacctggcaa	gtcttcttag	gatctgatcc	cagttttctg	180
gaagcaatcc	taccccagcc	caagcttccc	aagagtcgag	ccttaatcct	tctcacttct	240
cagtgtcaga	gcagaaatga	atcctggggg	tgactgtgtc	cattcggggt	attagcagct	300

<210> 323

<211> 300

<212> DNA

<213> Homo sapiens

<400> 323

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gagacaagat	ggtgaaggaa	ctgagcctga	tgaagagtca	ggaaatggag	cacctgttcc	120
tgtacctcca	aagagaacag	ttaaaagaaa	tatacccaag	ctggatgctc	agagattaat	180
ttcagagaga	ggacttccag	ccttaaggca	tgtatttgat	aaggcaaaat	tcaaaggtaa	240
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<210> 324

<211> 300

<212> DNA

<213> Homo sapiens

<400> 324

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tggcttgcag	ttgaactact	tcttgctgtg	tcttcacaag	catgccccca	tctgtgccc	120
ataagaactc	cagaccccaa	actcagctca	tacacacacg	gaagagagaa	gcattctgaac	180

atcaagaaga gaagaagctg ctggacatca gaaactgtga aaggagagga gtttggtga 240
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<210> 325

<211> 283

<212> DNA

<213> Homo sapiens

<400> 325

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aacaagtttg ccttctccta tgttttccag aaatgacttc agtatctgga gcatcctcag 120
aaaatgtatt ggaatggaac tatccaagat cacgatgcc a gttatatatta atgagcctct 180
gagcttccta cagcgctaa ctgaatacat ggagcatact tacctcgtcc acaaggccag 240
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<210> 326

<211> 300

<212> DNA

<213> Homo sapiens

<400> 326

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gtggctgcca gatggtaccc tgctggtggg cagtctggtc tagagggtcc atgatggctt 180
tactcacatg cctggcatct tgacagggac agctggaagg caaggttcag ctgggactgt 240
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<210> 327

<211> 300

<212> DNA

<213> Homo sapiens

<400> 327

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aacaccaaca gctacagacc aaaaaaagtc ccaacaaagg cctgtcagtc tgccagcctg 180
ttctgtggat ttccaactca agattgcagc atcaactcac acctgaagtt ctggcttccc 240
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<210> 328

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<213> Homo sapiens

<400> 328

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gcattggagt gtgtgatggt gcctgagtag atctgctggc agagtagttt gagccagctg 180
gactgggctg gccgcctgcc gcttcttgag ggtggaagag ggggtgctctg agaagacact 240
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 attggcattg tattttgcaa ctttcctaaa ctactagta attctagtag ctttttttg 180
 tagattctta aggattttct gtgtaaatag tcatgtcatt tgtgaataaa gccatttttt 240
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 cagaccccaa actcagctca tacacacacg gaagagagaa gcactctgaac atcaagaaga 180
 gaagaagctg ctggacatca gaaactgtga aaggagagga gtttggctga gctccagggg 240
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 <213> Homo sapiens

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 gtacctttcc ttgaacttat tcgtgataca gattcctttg ctacatgtt tccctgctga 180
 ccttcttccc acctgttgcc ctgctacact cccctcgcta agacagtaaa aataatgatc 240
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 <212> DNA
 <213> Homo sapiens

<400> 332
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 ggttgcaag gttgtcccca gaccttgctt gcagtgggtg gagaaccag ggggctgcct 180
 tgggccctct ggccagaggg aagcgggcag ctctagccct ggagattgtg gtcacattgg 240
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<210> 333
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<213> Homo sapiens

<400> 333

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gatcaagtag	cggaggccag	gattttggcc	acctccggg	caagttgcag	ggcagtggcg	180
ccgggagcaa	aagcagcatg	atgcagctca	tgcacctgga	gtccttttat	gaaaaaacct	240
cctcctgggc	ttatcaagga	agatgacact	aagccagaag	actgcatacc	agatgtacca	300

<210> 334

<211> 262

<212> DNA

<213> Homo sapiens

<400> 334

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cagaaaaaaa	ccttgttgac	ccctgcttta	gagaatgaga	agccatgcag	ggatcagtga	180
tgccagagga	agggaaaggaa	ctgcttccag	ctattgtgac	aataataata	ataataatat	240
tgggtctttg	actagaacgt	gt				262

<210> 335

<211> 300

<212> DNA

<213> Homo sapiens

<400> 335

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ggaaaagcctt	ccgagggcac	tcggactttt	ctaggcatca	gagtcaccac	agcagtgcga	180
ggccttatat	gtgtaatgaa	tgtggaaaag	ccttcagcca	gaactcgagc	cttaaaaagc	240
acaaaaagtc	tcacatgagt	gagaagccct	atgaatgcaa	tgaatgtggg	aaggctttta	300

<210> 336

<211> 300

<212> DNA

<213> Homo sapiens

<400> 336

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atcctcaagc	tggaagatac	ctctctggcc	ccggcacatg	tcaccctgc	actcctgcct	180
tcccgtgggc	acttcacat	cctctgggcc	tctggcagtt	cccagggact	gttttcacct	240
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<210> 337

<211> 300

<212> DNA

<213> Homo sapiens

<400> 337

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tatgcagaag	aatgaaacta	gacccccatc	tcttagcata	tacaaaaatc	aaaattaatt	180
aaaaagttaa	atctaagacc	tcaaactatg	aaacagctaa	aagaaaacat	cggggaatct	240
ctccaggaca	ttggagtggg	caaagatttc	ttgtgtaata	cctgacaaac	aggcaaccaa	300

<210> 338

<211> 292

<212> DNA

<213> Homo sapiens

<400> 338

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actcgcactt	tcattggttat	tgagggcaag	aaggctgccc	aaagacacga	gactttaaca	120
agcttgaact	tagaaaagaa	agctcgtctg	aaagaggaag	cagctatgaa	ggccaaaaca	180
gagtcagcaga	ggtatccgtg	ttggctggat	tttgaaaatc	caggaattat	gttataacgt	240
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<210> 339

<211> 300

<212> DNA

<213> Homo sapiens

<400> 339

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agggggggct	ggaccaacct	ggctttcccg	actgctccat	cgaggcagcc	atgggtgaagg	120
tgttcagctc	cgaggccgcc	tggcagtgtg	tgagtgaggg	gctgcagatc	ctcgggggct	180
tgggctacac	aagggactat	ccgtaccgagc	gcatactgcg	tgacaccgcg	atcctcctca	240
tcttcgaggg	aaccaatgag	attctccgga	tgtacatcgc	cctgacgggt	ctgcagcatg	300

<210> 340

<211> 300

<212> DNA

<213> Homo sapiens

<400> 340

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acctcaacct	cctgagtagc	taggactata	ggcacacagc	accatgcccc	ggctatTTTT	120
ttattttgta	gagatggggg	ctcactatgt	tgcccaggct	agtcttgaac	tcctggcctc	180
aagcaatcct	cccacctcgg	cctcccaaag	tgctgggatt	aaaggcgtga	gccaccgtac	240
ctggcccttg	gtggaatcct	tagggttttc	tattcataca	tataaaatca	tatcattggc	300

<210> 341

<211> 296

<212> DNA

<213> Homo sapiens

<400> 341

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caactttttc	atcacttggt	ttatgtagtt	gtctgatcaa	ttgtgaaaac	ataatgaatg	120
ttggaaatgg	aacagtaaaa	taacgaaagc	caactttttt	tttttttttt	ttnnnnnnnn	180

nnnnnnnnnt tnnccccng ncnngnanngc aggggcccac nntnggntnn ntgnanccnc 240
 cncncccggg ntnnnccct ttntcnngcc taaccnccc nagnacnngg aactac 296

<210> 342
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 342
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 gcctaccaag tagctgtgac cacagctgcc cctcaccatg ctaagctaatt ttttttaatt 120
 agatagtaca taaacgtccc aaaattagaa gataaaaaga catgagggat ccatttctaatt 180
 ttgtgttttg agtgaatgg tccagctcca ttcttctgca catggatatc cagttttaca 240
 caacactgtg aatgaatga atgccactga atcatacact caaaaatagc taaaatggca 300

<210> 343
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 343
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 cctgtgtctt gttttgtac agttttactg aaacacagcc atgcccattt gtttactcat 180
 tgtctatggt tgctttcatg cctcacagc aaaggcgagt agttgtgatg gatcaaatgg 240
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<210> 344
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 344
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 cccccaaccc caggccagcc ggccctgctc tggcgcgctc aaaatactac ctagcacagg 180
 cctctgctcg aggcaccccc aaactaccta tgtatccagc cccagagggc ctccattccc 240
 aggaagtccc tatgtatccc aacactggca gacaccagc accaccctcc cagacccgca 300

<210> 345
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 345
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 gccctgctct ggcgcgctca aaatactacc tagcacaggg ctctgctcga ggcaccccca 180
 aactacctat gtatccagcc ccagagggcc tccattccca ggaagtccct atgtatccca 240
 acactggcag acaccagca ccaccctccc agaccgcgaa gaaagtgaat ctactacta 300

<210> 346
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 346
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 accactactt ggcttgatat tgcttaatga aaagtatttt tctgacctaa gaaacagtat 120
 tgtgaacagc cagccaccgg agaagcagca ggccatgcac ctgtgttttg agaacctgat 180
 ggaaggcatc gagcgaaatc ttcttacgaa aaacagagac aggttcaccc agaacctgtc 240
 agcattccgt cgagaagtca acgactcaat gaagaattcc acttatggcg tgaatagcaa 300

<210> 347
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 347
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 atcctcattg aggagaacag gaaggatgac agaccccatg ctgtcccgcc acggcaagct 180
 gtgggtcaac ttctggggcg ccctgagccc cgatgagtac tacgcccgt ccgaggacta 240
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<210> 348
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 <212> DNA
 <213> Homo sapiens

<400> 348
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 aatatccgat acaaaggaga atctgtccag ggtgctttga tccttgacaga gctgctttca 180
 gcagtgaaac gctcactggc tcgaaccctg gtcattcatag tcagtctggg atatggcatc 240
 gtcaagccac gccttggagt cactcttcat aaggtttag tagcaggagc cctctatctt 300

<210> 349
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 349
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 accaagctct atttttcaga gacaacgtgt ggatgcttta ctttttagacc tcagacaaaa 180
 atttccaccc aaatttgtgc agctaaagcc tggagaaaag cctgttccag tggatcaaac 240
 aaagaaaagag gcagaacctt taccagaaac tgtaaaacct gaggagaagg agaccacaaa 300

<210> 350
 <211> 270
 <212> DNA

<213> Homo sapiens

<400> 350

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gcaatanggn gggcttcctg tccccaggnc cccccacag tgctntntgg cactggnaac	120
tctgctangg agngantgna nnnnaccant aannnnnnan nnatcnacan nnnnnnnncn	180
nnnnnnctn tnncnannn ntannctncc ntannnnanc cnnccannan cactcncnat	240
naacgnnnnn ttantgagan nttctcaact	270

<210> 351

<211> 300

<212> DNA

<213> Homo sapiens

<400> 351

aaatgactcc ctgcaaaaacc caacccatgc tgctggctgt gggatttttg gtgtaagcct	60
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cagtctattg tttaaagaga aggtgcattt gttcctcaat caagcaagag cacctgtgtt	180
gtactgcttt atatctcatg tatatttata gtaatgaaa gactttttta attgtacacg	240
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<210> 352

<211> 300

<212> DNA

<213> Homo sapiens

<400> 352

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aaaggggaat catgattata agtccttcag cccttggact cttaaattgag gggattaaaa	180
agaattttaa ataattttga acgaatttat tttccctca gtttttgagg gcattaaaaa	240
ggcattaaat caagacaaat catgtgcttg agaaaaataa aattaatgaa aacacagcac	300

<210> 353

<211> 300

<212> DNA

<213> Homo sapiens

<400> 353

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gtcatggcga ttccacacca agtacatgat gtggttccag aggcacgagg agccaagac	180
catcactgac gagtttgagc agggcaccta catctacttt gactacgaga agtggggcca	240
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<210> 354

<211> 299

<212> DNA

<213> Homo sapiens

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gaaggaggac ctaggcacac acatatggtg gccacaccca ggagggtagt ggggagttag      60
atttcagagt ccaggcccta gggtgggacc cactccaaat aatctcctcg gtgtgggtgg      120
tggttctata gagggataaa tgaataataa acattgttaa aatatacgaa aaaaaaaaaa      180
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa      240
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<210> 355

<211> 300

<212> DNA

<213> Homo sapiens

<400> 355

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ttatgggaca tccgacaatt taataaacca cttttttcag cctcgggtct tcccaccatg      180
ttccaatga ctgactgctg tttcagtcga gatgataagc tcatagtcac tggtagatct      240
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<210> 356

<211> 300

<212> DNA

<213> Homo sapiens

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agcaagacaa gatggtggat ccccatgccca ttacctgcta gactcagggt ttatatactg      120
tagtggagag gtgattccga aggaatgttg taagacaatt gaagagcagt aacatcaaag      180
ttatttgacc taagggcagg agttacagta agtatccact tttatacaag aaacaataga      240
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<210> 357

<211> 300

<212> DNA

<213> Homo sapiens

<400> 357

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acaaaaccta cagatggaga taaaaattac tactgttatt caacatgtgt tccagaacct      60
tattttgggg agtaaagtca attgggcaga ggatcctgcc ctttaaggaaa ttgttctgca      120
gcttgagaag aatgttgaca tgatgtaata agaattcatt tctgacatat tttacatttc      180
tggaatctc aactcttatt tggaataact ctgtgcattt gtctgtccac cgtaatttta      240
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<210> 358

<211> 300

<212> DNA

<213> Homo sapiens

<400> 358

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ggtgattaca gaagcccaga aggttgatac cagagccaag aacgctgggg ttacaatcca      60
agacacactc aacacattag acggcctcct gcactctgat gaccctgcac ttgatggacc      120
agctggcacc acccagatca ataaactggc ttatttgaat ttgcggcccc ccaccaggga      180

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actgactcag tgcaagaaga cagcttcgac tccctgtgat ttcattctctg accaatccgc 240
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<213> Homo sapiens

<400> 359
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aaagggtcag ttatgtgacc taaatgcaga actaaaacgg tgccgtgaga ggactcaaac 120
gttggaccaa gagaaccagc agcttcagga ccagctcaga gatgccagc agcaggtcaa 180
ggccttgggg acagagcgca caacactgga ggggcattta gccaaaggtac aggccaggc 240
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<210> 360
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<213> Homo sapiens

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tgagtggtaa attccaattc tgcagcagat cagtaaacctc acagtatttt tcctgtggaa 120
atctattcaa taaggaaacc aagacaggat aataaaattt aaaaaaaaaac aactttgaat 180
tcccctgect aggtcttcca gttgttttcc agcgcatacc tcaggtatga ctttgctagc 240
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<213> Homo sapiens

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tcattccctt tctcccaaag tactactgct gttgcatgac aaccccaaat atgttctgtc 180
aacacaaacc tgcctttggt gtataaacag ggcattacag aatggtacac cctatatatt 240
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<211> 300
<212> DNA
<213> Homo sapiens

<400> 362
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cccggcccat tatgaactcc tcttaagaag acgacggctt caggccccgg taactctggc 180
accccgatc gaggacaagt gagagagcaa gtgggggtcg agactttggg gagacggtgt 240
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<210> 363
 <211> 271
 <212> DNA
 <213> Homo sapiens

<400> 363
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 gcccggcggg ggctctcctg gcaagtcagg aaggtnnnnn nnnnnnnnnn nnnnnnnnnn 180
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 <212> DNA
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 tccgtcccgc atcccaggcg gagggcctag ggaacacttt gaagctgagc acgggggtgga 240
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 caggaacgaa tccctatcca caagttcacc actgcactaa aggcactgg actgcagaca 240
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<213> Homo sapiens

<400> 367

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agcatccaaa gttaaaaggg ttgtgcaact agctcgagag gaaatcaaga atggaaaatg	180
tgttgtaatt ggtctgcagt ctacaggaga agctagaaca ttagaagctt tggaagaggg	240
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<211> 300

<212> DNA

<213> Homo sapiens

<400> 368

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gtcctccgt cgtggatttc gcggcgaccc ccccggcagc tctttgcaa gctgcttgaa	180
acttctccca aactcggcat ggatacgact gcggcggcgg cgctgcctgc ttttgaggcg	240
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<213> Homo sapiens

<400> 369

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tctcaggatc ggattctgtt ttagagtgtt tctgggcccag gatccgggccc cctgccctcc	180
tctgcacctg accacactcc ctactcaggg ctagtctgtt cttcccggac atcttctggt	240
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<210> 370

<211> 273

<212> DNA

<213> Homo sapiens

<400> 370

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tggcccagga tgaggagagt gaggcctagc gcctggccat tatgatgatg aagaagctnn	180
nnnnnnnnnn nnnnnnnnnc atcatgtccn ntgcattggc acctatccca tatttnatnt	240
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<210> 371

<211> 300

<212> DNA

<213> Homo sapiens

<400> 371

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tctgtaggaa	accagactaa	tactgcttgt	agtccctgaag	agtcattgtg	tttaaaaaaa	180
cctatcaaac	gagtatataa	aaaatttgat	ccagttggag	agatttttaa	aatgcaggat	240
gagctcttaa	agccaatttc	cagaaaagta	ccagaattgc	ccttaatgaa	tttagaaaat	300

<210> 372

<211> 300

<212> DNA

<213> Homo sapiens

<400> 372

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tgctcccacg	tacggggcat	cttcgccgcc	ccccagccc	cagccaccac	ctcccgcagc	180
caggcggtc	agctatgcca	cgacggttaa	catccacgtg	ggcggggggtg	ggcggtgcg	240
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<211> 300

<212> DNA

<213> Homo sapiens

<400> 373

acccttctg	ccttctgtt	gggaccagc	tggtgttctt	tggtttgctt	tcttcaggct	60
ctagggctgt	gctatccaat	acagtaacca	catgcggctg	tttaaagtta	agccaattaa	120
aatcacataa	gattaaaaat	tccttctca	gttgactaa	ccacgtttct	agaggcgtea	180
ctgtatgtag	ttcatggcta	ctgtactgac	agcgagagca	tgtccatctg	ttggacagca	240
ctattctaga	gaactaaact	ggcttaacga	gtcacagcct	cagctgtgct	gggacgaccc	300

<210> 374

<211> 300

<212> DNA

<213> Homo sapiens

<400> 374

tcaaggccta	cgaacagggtg	atgcactacc	ccggctacgg	ttcccccatg	cctggcagct	60
tggccatggg	cccggtcacg	aacaaaacgg	gcctggacgc	ctcgccctg	gccgcagata	120
cctcctacta	ccaggggggtg	tactcccgcc	ccattatgaa	ctcctcttaa	gaagacgacg	180
gcttcaggcc	cggctaactc	tggcaccgcc	gatcgaggac	aagtgagaga	gcaagtgggg	240
gtcgagactt	tggggagacg	gtgttcgaga	gacgcaaggg	agaagaaatc	cataacaccc	300

<210> 375

<211> 300

<212> DNA

<213> Homo sapiens

<400> 375

cttcagtga	cacaacagga	gagaggagaa	agaagaaacg	ctagtaattc	caagcactgg	60
aattaagttg	ccttcacag	tgtttgcttc	agagtttgag	gaagatgttg	tgattgttaa	120
ataaagcagc	tccagtttca	ggacctcgac	tggattttga	tcctgacatt	gttgacgtc	180

ttgatgatga ttttgacttt gatgatccag ataatctgct tgaggatgac tttattcttc	240
aggccaataa ggcaacagga gaggaagagg gaatggatat acagaaatct gagaatgaag	300

<210> 376
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 376	
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ggggccagtt cagagaccca ctcccagggtg tgcattctct ttctcaagga tggtccttgc	120
tgagaaaaag aattcagtga tatttctccc atttgcttgt gaaagaagag aaatgtggct	180
ttgttccacc tggctcaccg gcggtcagaa tttaagggtta tctctcttgt ttcctaaaca	240
ttgctgttat cctgttcttt tttcaagggtg ccagatttc atattgctca aacacacatg	300

<210> 377
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 377	
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cccacatcat acagtttgaa atgaaacttt gccacaacca gcctttgctg tagcacacac	120
atatatcact gaacctgttt gaaataaagt ttttttctt tttcctctgg tattctgggt	180
tctgaagtct ggtattctgg tattctgggt tcaaaagtat gacttgagag tgttgctctg	240
gtattctgag agttgctctg tattctgggt tctgaagatt atttgaaaaa taactcctac	300

<210> 378
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 378	
tgcgtgtgat ccaaggataa aaaagttcaa ggaagaagaa aaagccaaga aagaagcaga	60
aaagaaagca aaagcagaag ctaaacggaa ggagcaagaa gctaaagaaa aacaaagaca	120
agctgaatta gaagctgctc ggtagctaa ggagaaagaa gaggaggaag tcagacagca	180
agcattgctg gcaaagaagg aaaaagatat ccagaaaaaa gccattaaga aggaaaggca	240
aaaacttoga aactcatgca agacctggaa tcatttttct gataatgagg cagagcgggt	300

<210> 379
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 379	
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cgaggcagct tcgagccaat ggtgagctcc ttctggatca gtccttcag ctcttcttgc	120
ctcaggatgc tgaattgca aggtgatgg aagacttggc ccggaacaag gaccaggagg	180
tgaacttcca ggagtatgtc accttctctg gggccttggc tttgatctac aatgaagccc	240
tcaagggtgc aaaataaata gggaagatgg agacaccctc tgggggtcct ctctgagtca	300

<210> 380
 <211> 296
 <212> DNA
 <213> Homo sapiens

<400> 380
 acctggacag ggccagctgc tgggggagcg gcactgggga ctggaggctg gaagcgggtg 60
 gtgtgtgtcc cctgtttact tttagctgag ctgggggttg gtgtacgggt tctgttcctc 120
 tgagccctgc ggcccacctg atgtttacgt gtgtgtgtga gggggggcnn nnnnnnnnnn 180
 nnnnnnnnnn ngtnatangc ttaacanatg nanagnacnac tnactnctga ttntttatnc 240
 atttgtgcat tnaaactatg cttttncgat cttnctgntg nnatnacngg catgat 296

<210> 381
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 381
 cagaaaagag tatagtaggg atgaccaagg tcaaagtggg taaagaagac tcatcatcca 60
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 atccaacttt actacaggat cctgatttaa ggcagttctt ggaaagttca gagctgccta 180
 gagcagttaa tacacaggct ctgagtgagg caggaatatt gaggatgggt aacaaggctg 240
 ccgacgctgt caacaaaatg acaatcaaga tgaatgaatc ggatgcatgg tttgaagaaa 300

<210> 382
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 382
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 tttgcatggt tcgggagagg tttgctgatt tggggcttat atgtcaggcc tttggtttgc 120
 gtcttatttt aggggttgtt tgggggcctg ggtggtcggc ctcacatggg aaggggatgg 180
 gtagtggatg gggtttctgt tgtatcttgt gggcggtgga ttttgctttt gtttttgttt 240
 cacattcttc ccctccaca agccaaagtc gtttcatttg gtttccactg tgtggactgt 300

<210> 383
 <211> 273
 <212> DNA
 <213> Homo sapiens

<400> 383
 gagatttgat attcgagtgc tgggcttagg tctgttgata aatctagtgg agtatagtgc 60
 tcggaatcgg cactgtcttg tcaacatgga aacatcgtgc tcttttgatt cttccatctg 120
 tagtggagaa ggggatgata gtttaaggat aggtggnnnn nnnnnnnngc cngcnttnac 180
 ttatngcnn ctttttcttg atcnacgnnc gnnatncnna nngtntata ntaatncnga 240
 anantnttt gnnntgcttt atcaantntt cnt 273

<210> 384
 <211> 259

<212> DNA

<213> Homo sapiens

<400> 384

aagagaagga	cctagagatt	gagaggctta	agacgaagca	aaaagaactg	gaggccaaga	60
tgttgGCCCA	gaaggctgag	gaaaaggaga	accattgtcc	cacaatgctc	cggccctttt	120
cacatcgCAC	agtcacaggg	gcaaagcccc	tgaaaaaggc	tgtggtgatg	cccctacagc	180
taattcagga	gcaggcagca	tccccaatg	ccgagatcca	catcctgaag	aataaaggcc	240
cgaagagaaa	gctggagtc					259

<210> 385

<211> 296

<212> DNA

<213> Homo sapiens

<400> 385

agagcctgca	agtgacaaag	gaagtgaggc	agaggccac	atgccccac	cgttcacacc	60
ctacgtgcct	cggattctga	acggcttggc	ctcggagagg	acagcactgt	ctccgcagca	120
gcagcagcag	cagacctatg	gtgccatcca	caacatcagc	gggactatcc	ctggacagtg	180
cttggcgcat	agcgccacgg	gcagtgtggc	ttgctgcccc	ccaggaggcc	tgaggctggg	240
tctcactgct	ctgaaaaaga	ccnnccaaa	atgggccttg	gggctnnagg	cccttg	296

<210> 386

<211> 300

<212> DNA

<213> Homo sapiens

<400> 386

gaagaggagg	ctgtgtatga	ggaacctcca	gagcaggaga	ccttctacga	gcagcccca	60
ctggtgcagc	agcaaggtgc	tggtcttgag	cacattgacc	accacattca	gggccagggg	120
ctcagtgggc	aagggtcttg	tgcccgtgcc	ctgtacgact	accaggcagc	cgacgacaca	180
gagatctcct	tgacccccga	gaacctcatc	acgggcatcg	aggtgatcga	cgaaggctgg	240
tggcggtggc	atgggcccga	tggccatttt	ggcatgttcc	ctgccaaacta	cgtggagctc	300

<210> 387

<211> 300

<212> DNA

<213> Homo sapiens

<400> 387

ccgcagaggg	cctggaagag	gtgctcacca	cgccagagac	tgtgctcaca	ggccacacgg	60
agaagatctg	ctccctgcgc	ttccaccac	tggcagccaa	tgtgctggcc	tcgtctcct	120
atgacctcac	tgttcgcatc	tgggaccttc	aggctggagc	tgatcggtcg	aagctgcagg	180
gccaccaaga	ccagatcttc	agcctggcct	ggagtcctga	tgggcagcag	ctggccactg	240
tctgcaagga	tgggcgtgtg	cgggtctaca	ggccccggag	tggccctgag	ccctgcagg	300

<210> 388

<211> 300

<212> DNA

<213> Homo sapiens

<400> 388
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 gagcacattt tgtagggtgg caccttttta tccaagttac tagctacaca tcagtgttta 120
 aagagaaaaa agtgaccttt catttttttt tcttgaaact tgaggaaaca agatacatac 180
 tactgatttt ttttttctta aaactaaatg catgactgca gagcggtaga ggtgtatatt 240
 tttcatactg tggggcaaag tatttggtgct gctttttgga gatggactgg aacgtctggt 300

<210> 389
 <211> 293
 <212> DNA
 <213> Homo sapiens

<400> 389
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 tgcaggctga atggcgagg cgttggacaa gtcaacatct ctgtagtgca gtccaccgtc 120
 tccagtggct atggcggtgc cagcggtgtc ggcannnnnn nnnnnnnnnn nnnatgaanc 180
 agntactcct atggnnttag cnttntanct atnacctgcn cnaactannc tnanagtcta 240
 gnncttgccc caaccctac ttttgtattt atattgtgtg tgcgtgtgtg cgt 293

<210> 390
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 390
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 ctgcaagtga caaaggaagt gaggcagagg ccacatgcc cccaccgttc acaccctacg 120
 tgcctcggat tctgaacggc ttggcctcgg agaggacagc actgtctccg cagcagcagc 180
 agcagcagac ctatggtgcc atccacaaca tcagcgggac tatccctgga cagtgtctgg 240
 cgcagagcgc caggggcagt gtggctgctg cccccagga ggctgaggc tgggtctcac 300

<210> 391
 <211> 257
 <212> DNA
 <213> Homo sapiens

<400> 391
 acccgctcgg ggccggccaa tttgcatatt tggaatgcgc cgctataaac cgggctgggg 60
 ttttgcagcg atttcttaga tgtaaaaatg agatctcaat agcagcgggc tgggcacatc 120
 ctctcctctc tccttctctc tctgcccgga gctggtttcc gtctctcggc tcggggctgg 180
 aactccggcc caacctaggc gcgcagcgc cacgagatgg cgcacttccg atcaatgtca 240
 aagccgcccgg ggagccc 257

<210> 392
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 392
 gcgcgagcgt cggctccgcc tgggcccctt cggtgcgctg cgggcaggcg gtgaggctca 60
 cgcgtgtgct tacgggcaag aacctgcaca cgcaccactt cccgtcgccg ctgtccaaca 120

accaggaggt	gagtgccttt	ggggaagacg	gcgagggcga	cgacctggac	ctatggacag	180
tgcgctgctc	tggacagcac	tgggagcgtg	aggctgctgt	gcgcttccag	catgtgggca	240
cctctgtgtt	cctgtcagtc	acgggtgagc	agtatggaag	cccatccgt	gggcagcatg	300

<210> 393
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 393						
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cgcatgtgct	tacgggcaag	aacctgcaca	cgcaccactt	cccgtcgccg	ctgtccaaca	120
accaggaggt	gagtgccttt	ggggaagacg	gcgagggcga	cgacctggac	ctatggacag	180
tgcgctgctc	tggacagcac	tgggagcgtg	aggctgctgt	gcgcttccag	catgtgggca	240
cctctgtgtt	cctgtcagtc	acgggtgagc	agtatggaag	cccatccgt	gggcagcatg	300

<210> 394
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 394						
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aaaggaggag	aggctgtctg	cctttatgag	gagccagtgt	ctgaattgct	gaggagatgt	120
gggaattgca	cacgggaaag	ctgtgtggtt	tccttttacc	tttcagctga	ccatgaactc	180
ctgagcccgga	ccaactacca	cttcctgtcc	tcaccgaagg	aggccgtggg	gctctgcaag	240
gcgcagatca	ctgccatcat	ctctcacnag	gngaccatat	tggtttttga	cctggagacc	300

<210> 395
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 395						
gcaaaatcaa	tgtggactga	acataaatca	cctgatggaa	ggacttacta	ctacaacact	60
gaaaccaaac	agtctacctg	ggagaaacca	gatgatctta	aaacacctgc	tgagcaactc	120
ttatctaaat	gcccctggaa	ggaatacaaa	tcagattctg	gaaagcctta	ctattataat	180
tctcaaacaa	aagaatctcg	ctgggccaaa	cctaaagaac	ttgaggatct	tgaagcaatg	240
atcaaagctg	aagaaagcag	taagcaagaa	gagtgcacca	caacatcaac	agccccagtc	300

<210> 396
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 396						
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cccaccacac	tgaatctccc	ctcctcacag	ttgccatgta	gacccttgga	agaggggagg	120
ggcctaggga	gccgcacctt	gtcatgtacc	atcaataaag	taccctgtgc	tcaacaaaaa	180
aaaaaaaaaa	aaaaacnnnn	nnnnnnnnnn	nntntngggn	gnctnntnnc	nnaaanccan	240

ncttnataaa anccttngnt natttggaaac aaccncann taaanngcag ggaaaaaaag 300

<210> 397

<211> 300

<212> DNA

<213> Homo sapiens

<400> 397

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cttctcactt	ctcagtgtca	gagcagaaat	gaatcctggg	gttgactgtg	tccattcggg	180
ttattagcag	ctaagaagcc	cagacgagta	gtgtgagctg	ccttgggagc	ctcagtgagg	240
gcactgggac	tggcctcact	ctcttgcccc	cagcctagtg	ggctttctcc	tctgtctctc	300

<210> 398

<211> 300

<212> DNA

<213> Homo sapiens

<400> 398

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tttgttgccc	aggcaggaca	aaaactcatg	atgtcccaga	gggaatcact	gatgtcccat	120
gcaatagaac	tgaaatcagg	gagcaataag	aacattcaca	ttgctctggc	tacattggcc	180
ctgaactatt	ctgtttgttt	tcataaagac	cataacattg	aagggaaagc	ccaatgtttg	240
tcactaatta	gcacaatctt	ggaagtagta	caagacctag	aagccacttt	tagacttctt	300

<210> 399

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<212> DNA

<213> Homo sapiens

<400> 399

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gtctctcca	aaatacaggt	cagcaaactt	gaaagcagcc	tgaaacagag	caagaccagc	180
tgtgctgaca	tgcataagat	gctgtttgag	gaacgaaatc	attttgccga	gatagagaca	240
gagttacaag	ctgagctggt	cacaatggag	caacagcacc	aagagaaggt	gctgtacctt	300

<210> 400

<211> 300

<212> DNA

<213> Homo sapiens

<400> 400

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aaaatgatgt	gatgatcaga	aaagaggctt	atgtgcacaa	gagtgtaatg	gaagaactga	180
agagaattat	tgatgacagt	gaaattacaa	aagaagatga	tgctttgtgg	cctccccctg	240
atagggttgg	ccgacaggag	cttgaaattg	taattggaga	tgagcacata	tcttttacca	300

<210> 401

<211> 300
 <212> DNA
 <213> Homo sapiens

<400> 401
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 tggaggggtc ccggaagagc tgggtcccgt gggtgagctg gtccccgtgg ttgaattgga 180
 agaggccata gccccaggct cagaggccca gggcgtggg tctgggtggg acgcgggggt 240
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<210> 402
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 402
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 atttgagggt gacccttca aagaaagtga ccattccgt ggctctgcca ctgacgactt 180
 cttcaagaaa cagacaaaga atgaccatt tacctcggat ccattcacga aaaacccttc 240
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<210> 403
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 403
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 aagcactcaa atgggaagaa aggaaatgtc tcattcctgga agaaatcctg gcctaccagc 180
 ctgatataatt gtgcctcaa gaggtggacc actattttga caccttcag ccactcctca 240
 gtagactagg ctatcaaggc acgtttttcc ccaaaccctg gtcaccttgt ctgatgtag 300

<210> 404
 <211> 300
 <212> DNA
 <213> Homo sapiens

<400> 404
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 ctctgtgcaa acttgatgag ctttctgcta agcgagagac tagtggagaa aaatccagac 120
 aattaagaga tgctcagcag gatgcaagag ataaaatgga ggatatcgaa cgccaagtta 180
 gagaattgaa acaaaaaatt tcagctatga aagaagaaaa agaacagctt agtgctgaaa 240
 gataagagca gattaagcag aggactaagt tggagcttaa agccaaggat ttacaagatg 300

<210> 405
 <211> 856
 <212> DNA
 <213> Homo sapiens

<400> 405

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gagttagatt	tcagagtcca	ggccctagg	tgggaccac	tccaaataat	ctcctcggtg	180
tggtggtgg	ttctatagag	ggataaatga	ataataaaca	ttgttaaaat	atagcaaaaa	240
aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	anaanaaaaa	300
aaaananaaa	aatnaaaaa	annanaaaaa	aaaaaaaaa	aannccccn	cncctaaaa	360
nattcngggg	ggntttttcc	tccannccnn	ntntttaata	nnctnctnt	tgnntcttng	420
netcaccnnt	tcttttggt	ggcnntaana	naaaatnttn	nttttttttn	ggntanaaat	480
ncnntnnng	ttttttntnn	ttttttttcn	aaaccctcct	ntntntanct	ncgtntcnaa	540
aaantntttt	ntccnccnnc	nttntntnt	ntnttttcta	ttttnttttc	ttntncaann	600
ttccnangtg	nnnngngtnt	nttngggcct	gtttnttttt	ncnncctngc	gtcatccnnc	660
caataatttc	ttnnccccc	nannccnnt	ttttntnnnc	ctctatntnn	gnngngnnat	720
atnantcccc	tttatnttn	atnantagtc	ntntnttttn	ttntccntng	tnatannatt	780
ttntntcccn	ntntaanttc	ctcannnnat	ttntntnnnc	ncngngtata	tttnangnta	840
nttcnncggg	gttnct					856

<210> 406

<211> 843

<212> DNA

<213> Homo sapiens

<400> 406

tnntnnnnnc	gnangctggn	nnnttctncc	cnttttcta	ngttntcta	actanggatn	60
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actcgatgaa	gaggggtgtc	attctgggct	cggggtggtt	gccaattttt	caccagaaag	180
ggagccaccc	cttgcaacca	cttctgtctc	cgtagcccc	ccctctgccc	tcctccaagc	240
caaagcgtgg	cctggctttt	gtcttcccat	ttagtttttc	tcttttacc	ttccttttgt	300
gcttaattta	ttaaaatagt	tgctgtataa	tttattttca	taaactataa	aaaaatacta	360
aatggttaaa	atagacttgc	aggccaatct	taaatggggt	gggaggggtc	tgaggggtgg	420
atggggaaag	ggaaagaggt	tttgatntaa	acaaaacaaa	tgacttttgg	gtgtgtnnng	480
gnatttttnt	ggggatanan	gggggtgggg	nnnnngnann	nnnnnnnnnn	nnnnnnnnnn	540
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	600
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	660
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	720
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	780
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<210> 407

<211> 743

<212> DNA

<213> Homo sapiens

<400> 407

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atatagagga	agtagattag	tgggtgcttc	gggatgggag	gaatgggaag	attgaggtct	180
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ttggatctgt	gtcttcaccg	agtctcatgt	tgaaatgtaa	gccccctggt	gggaggcgat	420
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gatattgagt	cctcatcaca	tctggttgct	tcaaagtgtg	tggtgcctcc	cctctatctc	540
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gtttcctgag	gcctnctag	aacaaaactg	ctgtgctttc	tgnncccatc	tacaggaccc	660
ggagccaatt	naaccccttt	tctttataaa	aaaaaannnn	nnnnnnnnnn	nnnnnnnnnn	720
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<210> 408

<211> 746

<212> DNA

<213> Homo sapiens

<400> 408

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tttttggttc	acacactggt	ttccatgtaa	tngatgttga	ttcaggaaac	tcttatgata	180
tctacatacc	atctcatatt	cagggcaata	tcactcctca	tgctattgtc	atcttgcccta	240
aaacagatgg	aatggaaatg	cttgtttgct	atgaggatga	gggggtgtat	gtaaacacct	300
atggccggat	aactaaggat	gtggtgctcc	aatggggaga	aatgcccacg	tctgtggcct	360
acattcattc	caatcagata	atggctgggg	cgagaaagct	attgagatcc	ggcagtgga	420
caggacattt	ggatggagta	ttnatgcata	agcgagctca	aagggttaaag	tttctatgtg	480
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cttatcttca	tggcgttatt	ctaatttaaa	aagaacataa	ctcatnggga	cttatgccca	660
gtctagaggc	agaatcagaa	ggcttgggtg	gaacatatcg	ntttcctttt	tcctttcctt	720
cggccctncc	agnccagtcc	atnttt				746

<210> 409

<211> 761

<212> DNA

<213> Homo sapiens

<400> 409

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gcacatcttt	cagactctac	tatttccgtc	aagtttctgt	ttgatttgga	tcacttcagg	180
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caggagaggg	ctgggtgggg	cagagccagg	aggggacctg	gtgtgtcacc	tgcccaccac	360
ctggctcatc	cctcangccc	accctgaccc	tacattacat	aggttacgtc	agcctactgt	420
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atgaantggc	tctgtcctgt	cactggcctc	tccttgccctg	ggggctatgt	gcacttcaaa	600
accctggcca	agctcaagcc	catgaagnat	tggagaacac	cctggggccc	caagaactgg	660
angcaccggg	ccanttcccc	tgggattcca	nctttgccan	ggtgaaccct	tcttttacc	720
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<210> 410

<211> 748

<212> DNA

<213> Homo sapiens

<400> 410

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gaaaaancag	ctttgtcctg	ggtgaaaaag	gatgccaaaa	ttgcctggaa	aagagcagtg	180
anaggagtc	gggagatgtg	tgatgcntgt	gaagcancat	tgtttancat	tcactgggtc	240
tgccaaaaat	gtggatttgt	ggtctgctta	gattgttnca	aggcaaagga	aaggaagagt	300
tctagagata	aagaactata	tgcttggtatg	aagtgtgtga	agggacagcc	tcatgatcac	360
aaacntttaa	tgccaaccca	aattatacct	ggttctgttt	tgacagatct	tctagatgcc	420
atgcacactc	ttagggaaaa	atatggtatt	aatcccat	gncattgtct	aacaaacaga	480
atttacaagt	tggaattttt	cctncatgaa	tggtgtatct	caagtttaca	gaatgtctta	540
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tctgagaaaa	atggtggcag	cnccccana	aagtgatgtt	nggcncagga	ttaccaggtt	660
aacttcctcc	agaatnccag	tcaccactgn	actggnatgc	anatcttgcc	gagccaaaaa	720
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<210> 411

<211> 773

<212> DNA

<213> Homo sapiens

<400> 411

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atgcttggca	gctnggccat	gggcccggtc	acgaacaaaa	cgggcctgga	cgctcgcgc	180
ntggccgcag	atacctccta	ctaccagggg	gtgtactccc	ggccatttat	gaactcctct	240
taagaagacg	acggcttcag	gcccggctaa	ctttggcacc	ccggatcgag	gacaaagtga	300
agagcaagtg	ggggtcgaga	ctttggggag	acggtgttgc	agagacgcaa	gggagaagaa	360
atccataaca	ccccacccc	aacaccccca	agacagcaat	cttcttcacc	cgcttgcaac	420
ccgttccgtc	ccaaacagag	ggccacacag	atacccacag	ttctatataa	ggaggaaacc	480
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gcttcttcaa	cacctgcaga	ttctgatttt	tttgttgttg	gttgttctct	ccattgctgn	600
tggtgcangg	aagtcttact	taaaaaaaa	aaaattttgn	gagtgcactg	gtgtaaaacc	660
atgttanttt	taacagaacc	nanaagggtt	gncctatttg	ttaaaaaaa	aaaaaaaaa	720
aaacttngng	cctttagaac	tattannngag	nccnatttac	nttaatccan	nct	773

<210> 412

<211> 774

<212> DNA

<213> Homo sapiens

<400> 412

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ccgagatgtc	atgggttcaa	gtgctggggc	cggcagtgga	gagttccacg	tgtacagaca	180
tctgcgccgg	agagaatatc	agcgacagga	ctacatggat	gccatggctg	agaagcaaaa	240
attggatgca	gagtttcaga	aaagactgga	aaagaataaa	attgctgcag	aggagcagac	300
cgcaaagcgc	cgaagaagc	gccagaagtt	aaaagagaag	aaattactgg	caaagaagat	360
gaaacttgaa	cagaagaac	aagaaggacc	cggtcagccc	aaggagcagg	ggtccagcag	420
ctctgcggag	gcatctggaa	cagaggagga	ggaggaagtg	cccagtttca	ccatggggcg	480

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aggcggctgt	ttggctcttt	cttccccgca	aggaccccg	ttaccgctg	gatggagagc	600
aaaggagacc	cccttccgag	cccgntcaca	gtcctgtatt	tggcaagggt	tgggaacctg	660
aaggggccaa	tntnccttga	cacttanang	cacttgctt	tcagacacca	ttccngcgt	720
ctggtaaaag	gggacaagaa	aagccttaac	cttggcnnca	tattttgaca	gggg	774

<210> 413

<211> 773

<212> DNA

<213> Homo sapiens

<400> 413

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aaaggactga	gtgcagaaga	aaagagaact	cgctgatgg	aaatattttc	tgaacaaaaa	180
gatgtatttc	anttaaaaga	cttggagaag	attgctccca	aagagaaaag	ctttactgct	240
atgtcagtaa	aagaagtcct	tcaaagctta	gttgatgatg	gtatggttga	ctgtgagagg	300
atcggaactt	ctaattatta	ttgggctttt	ccaagtaaag	ctcttcatgc	aaggaaacat	360
aagttggagg	ttctggaatc	tcagttgtct	gagggaaagtc	aaaagcatgc	aagcctacag	420
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ncaaagactg	tgatcccga	agttgtngga	agaaatcgcc	aagcaaatna	agtagcccaa	600
ggaactgctt	acagatggac	tgattacata	ttcgcaataa	aatcttnggc	ccaaagaaaa	660
atttnggggt	tgaaggaaaa	ttaaattggt	tngaaccttt	tgggaatttcc	cgaagactt	720
ttgcctncnt	ngacttaaaa	tatttccatg	gnggtgaaag	gttgtccaan	ctt	773

<210> 414

<211> 755

<212> DNA

<213> Homo sapiens

<400> 414

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tttgatccca	ggcttagcac	acgattgcat	ggcttcccct	ttagccactt	naaccactgc	180
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cgtagtccag	ttctgngttt	tcttgggata	tgaaaagaat	gaccanggac	tnctggagtc	660
aacttttcac	ttgaagaatc	tcaaggccac	cggtcattgg	ccacacactn	gaactccttt	720
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<210> 415

<211> 852

<212> DNA

<213> Homo sapiens

<400> 415

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ccnttcgtag gatggtgagt gtttccttg gctttgctca tcaacttcggg acatcgtgga      180
ctttaccgtg cgcnttgag tgtgtgatgg tgcttgagta gatctgctgg cagagtagtt      240
tgagccagct ggactgggct ggccgcctgc cgcttcttga ggggtggaaga ggggtgctct      300
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acctgggaag aagaaaatca ccagattgt tgggaatat tttggncatt aaaataaant      720
aatggaaaac ctnaaaaaa aaaaaaaaaa aaactcgag ccnttaaaa acttttagtg      780
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<210> 416

<211> 754

<212> DNA

<213> Homo sapiens

<400> 416

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tggtggaggg ttcttagtga gttgggggac ctggcantan agctgcttgg ttggaggaag      180
tgaanctggc ttantaccag cagctgatct ctccacgtg ctgctgcttt ttttgccact      240
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acaaganttg ctttgaaaag ancctgtttt taggggatta ttttttgnat accccgatgg      660
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<210> 417

<211> 755

<212> DNA

<213> Homo sapiens

<400> 417

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gcgcgcgaag ttcttgaaa cggtggagtt gcagatcagc ttgaagaact ntgatcccca      180
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caagaagtat gatgcgtttt tggcctcaga gtcttttgat caagcagatt ccacgaatcc      420
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gtggccaaag	tggatgangt	gaagtnca	atcaagttnc	aatgaagaa	ggtgttatgt	540
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ttcacctggc	tgtcaacttc	ttggnggtca	attgcntcaa	agaaaaaact	tgggcagaaa	660
tgttccnggc	cttatntnt	caagaaccnc	catggggcna	agccccaacg	cccttntttt	720
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<210> 418

<211> 757

<212> DNA

<213> Homo sapiens

<400> 418

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cagacagaac	cagtgtcatc	ttacacgtat	taattggatg	tcctgngnct	tccttaatat	720
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<210> 419

<211> 738

<212> DNA

<213> Homo sapiens

<400> 419

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cgcattaacc	tgaacctcct	gtancangcc	cangtcgtgg	tggccgattt	ggaacccacg	720
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<210> 420

<211> 739

<212> DNA

<213> Homo sapiens

<400> 420
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 aattttacag tccgggaan 739

<210> 421

<211> 727

<212> DNA

<213> Homo sapiens

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<210> 422

<211> 753

<212> DNA

<213> Homo sapiens

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 ttgatagcca aacaacagtt ttggattcac tgactgatta tgaaagaagc agtagactgg 180
 tatcaagaat cagtcagcaa ggaggccctc accagacgcc agtgccatgt tcttggactt 240
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 cctgagctaa cctactggag gatgagccat cacctggagc agattcaggc catcctagtt 360
 gaagcctccc taggccaagc aaccgtccaa ctaccagaca ttgaccattc agccttgaac 420
 attcagcaca aagacaaaac agaccagacc agaagagtcc cacagaatag gggaaactat 480
 tcagagaaaa cttaagccac taagttttat ggtgttttgt tcttgtagcc agaagcatag 540
 gcatactggc caatacaaac cgaaatcctt ctaacgtant ggaccctttt caggccagca 600

ttttttccct	tgaaaacctg	ggagccttgt	attccatctt	attagcagaa	gatcactttc	660
accaatggtt	tgggctcttg	atttggaatt	gatgatgtaa	tgagcctnta	ttcnanatgn	720
gacttaatac	ctctgcgaat	tgactggatt	ccn			753

<210> 423
 <211> 844
 <212> DNA
 <213> Homo sapiens

<400> 423						
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ggtaccggca	accacgggca	gctctcaggg	aatctccgtc	gttgaggcca	naggctccag	180
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gagggtgatt	ctgctgctga	gatgaatggg	gaggaggaag	agagtgagga	ggagcgganc	300
ggcagccaga	cagagtcaga	agaggagagc	tccgagatgg	atgatgagga	ctatgagcga	360
cgccgcancn	agtgtttcag	tnagatgctg	gacctggaga	agcagttctc	ggaagctaaa	420
nggagaagtt	gttcaaggga	acgacttgan	tcantgccc	gnttgcggtc	tggaaggaaa	480
ntgggggggc	ttgaanaaga	agcccctgga	atnccaccgg	aagccccctt	ttgggggggg	540
gccttgcaaa	ccgggaancc	ctttnaagg	aatttcngcc	antttcaang	gttgggccaa	600
ggggaatcnt	accnaagggg	ccttctnngc	cttggnatgg	tgaatccang	gnaaattaag	660
gtncccaatt	gntgaancc	tccaanggga	ancccaaac	agcacccttg	naanaagttg	720
agaaaacttg	cttgcntctt	ntgacacccc	tncnaggggg	aacttcaagg	aaccggttcc	780
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accn						844

<210> 424
 <211> 799
 <212> DNA
 <213> Homo sapiens

<400> 424						
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tttgaggccc	agcaatctat	ggtttaacaa	gccatccagg	tgtttctgat	gcacagtga	180
attggggtag	cactggtatt	aggtttggtg	tggcaacttt	ttcatcactt	gttttatgta	240
gttgtctgat	caattgtgaa	aacataatga	atgttggaag	tggaacagta	aaataacgaa	300
agccaacttt	tttttttttt	tttgagacgg	agtcttgctc	tgtcgcccag	gctggagtgc	360
agtggcgcca	tctcggtcca	ctgcaagctc	cgcctcctgg	gttcacgcca	ttctcctgcc	420
tcagcctccc	gagtagctgg	gactacaggc	gcccgnccac	acgcccggct	aattttttgn	480
attttttagta	gagacggggg	ttcacctgtg	tagccaggat	ggtctcgatc	tcctgacctc	540
gtgatccacc	cgcctnnggc	ttccaaagtg	ctgggattac	aggcgtgagc	caccggggccc	600
gggcaaaaag	ccaactcttt	atgcctagaa	aatattgtgc	accctatgac	ccaagcccat	660
tgaatttttn	cngggaaatt	tatggtaa	tattgaaatg	gatggtacct	ttaaaaagtt	720
atttggcaca	ttccccttgg	gttacctttg	gnatggtttg	ccagggaatt	naaaactttg	780
ggntnaaacc	ttttttann					799

<210> 425
 <211> 750
 <212> DNA
 <213> Homo sapiens

<400> 425

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cctcagaaca	tgctgagcac	atttttagtg	gtggcacctt	tttatccaag	ttactagcta	180
cacatcagtg	tttaaagaga	aaaaagtgac	ctttcatttt	tttttcttga	aacttgagga	240
aacaagatac	atactactga	tttttttttt	cttaaaacta	aatgcatgac	tgagagcg	300
tagaggtgta	tatttttcat	actgtggggc	aaagtatttg	tgctgctttt	tggagatgga	360
ctggaacgtc	tggtttctgt	cccggggccc	ggcagctacg	tctattttct	gtagaagggtg	420
ccacagttag	acctggagcc	accccttctc	gcttgggccc	gtttanagct	gggagcccgt	480
ggactccggc	ctgtttctac	cttctattca	accactctga	cgtggggaga	caagaagaaa	540
tagaactttt	tgatagtgtg	gtaaaaacat	tggattttga	actatttttag	taaaaggagt	600
taccaacaag	aatgtnatag	gtgctacttt	gagctagata	aataaaggct	ctttgtgagc	660
ctcctgaaaa	aaaaaaantt	nnnnnnnnnn	atnnnnnnnn	annaaaaaaa	ctggnccttt	720
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<210> 426

<211> 819

<212> DNA

<213> Homo sapiens

<400> 426

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angannnnnt	gcganncgaa	ttcggcacga	aggggggttc	ccaatagtag	aaaagggtcc	120
ccattcctgc	tcagcaccgc	acctctctac	ccccccacag	acacacatgc	agacacacac	180
atgcagacaa	cacgcagaca	cacacatgca	ggcactcaca	tgaggccca	tgacacacaca	240
cgtgcacaca	catgcagaga	catgcagaca	cgcaggcaca	catgcacaca	tgcaaagaca	300
cgcattgcagg	cacacgcaga	cgcacacaga	gacacacatg	cagatcacat	gcacacacac	360
atacacacac	tggtccctgt	ttttctgtgg	tgctactggg	tgccagcaac	tcggtatctn	420
ccaccttcca	ctaaaacctg	ggccttaatt	tctctccctg	ccccaccctt	aaattcctga	480
tggtatgaacc	tagagctgtc	ctgtccactc	caggccggac	tgacgtancc	tatgggcccc	540
gcagggtccag	ggcccacgtt	ttaatttctt	tttnaaaagc	tttaggtctt	ggccnggccg	600
ccggtgggttc	acgccttggg	agttcccagc	attttttngg	aaggccnaag	gccgggttgg	660
attcacaag	gtcaagcaag	tttcaaggaa	ccaagccttg	aaccaggcca	ttgggtgagg	720
aaccctgggc	ttnttactng	ggnaaattcc	caaaaaaaaa	ttggccttgg	gccnaagggt	780
gggcaagggc	acccttggtg	gggtccccaa	antttacct			819

<210> 427

<211> 750

<212> DNA

<213> Homo sapiens

<400> 427

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nntgcgatcc	gaattcggca	cgagggtccaa	ggacaacttc	gagacatttc	tttttgccac	120
cgtatctaac	agggagcagg	aagatctctg	ccgaggaatt	gtccagctct	gcttcaatga	180
gcaaagccaa	cagctgctag	cagagggtcca	gccctctgac	tctttcctca	tggtagagac	240
aactgcatac	tttgaggcct	acaggcacgt	cctggaagga	ctccaggagg	tccaggagga	300
agatgttccc	ttccagagga	atatcgtgga	gtgtaactct	catgtgaagg	agccaaggta	360
cttgctaattg	gggggcagat	atgactttac	ccccttaata	gagaatcctt	cagccactgg	420
ggaatttcta	agaaatgtcg	aggggttgag	acatcccaga	attaatgtct	tagatcctgg	480
ccagtggccc	tcaaaagaag	cctgaactg	gatgactcca	gatggaagcc	ttgcagtttg	540

ctctcacaag	ggaactgggt	attattcaag	gaccttcttg	aacaggcnaa	acctatgtgg	600
gtctnaaaaa	ttgttcaagc	ccttctacca	acgagtcttg	tttggcaaaa	ttaaccttca	660
gaaattccca	tcttggttgn	gtgtatacta	atcatgcttt	ggaccanttc	tggaangctt	720
ttccattgtc	agaaaaccan	atttgccgg				750

<210> 428

<211> 943

<212> DNA

<213> Homo sapiens

<400> 428

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anaaaagnnt	gnngcgggtg	gctcaagggc	caccanaaca	tttctttatt	attattatttt	120
tttaacctgn	acatgcntta	aagggtctat	tacctttctt	tccgtctgtc	tcaacagctg	180
aaatggggcc	nccaaggagt	gccttccctt	tgctccctcc	tactgggact	gacggntggg	240
antgtntgnn	cccanntggg	ggtgtctcct	gnctgggaag	ganggaaagg	gaggcanagt	300
tttgccgggg	ttgcanntng	acancangct	gnanaggana	tggtctaata	ctgtttaatg	360
gaaacctgct	tggtgcttga	nggaacttag	nctgaatttt	cccgaacttc	tctgccagtt	420
attgacacan	tctctttnta	agacangaaa	taaaactaac	cccaccccaa	ggnantnatn	480
ncangcngaa	aacnncncat	ngcccacatt	ncctnatecc	ntancaccnn	ctcnttnttt	540
nncccaanac	tncttcccan	ntntcnccnt	ttacccttan	ncntnnttnt	atcccnctaa	600
tnctnannnn	ccntnnttnt	ccnnatnctt	acnncnccnn	ntnnnncccn	ntcttntnnn	660
cccaaanctn	ncctcnccnt	tcnnctnaac	cntntnnnca	nnanacaccc	ttctnatnnc	720
ccannntctn	cacnntnnnt	ntctccnnnt	nnncnccnnn	ntcntnnnnn	nancntntnn	780
nanancnate	tnntnccnnc	cnantnnnnn	tcanttcacn	ctctnnnnnn	tnancnncat	840
tnnccntcnn	tnnccnntta	nnncntnnnn	nnncaantnn	nnnnanctct	ncnnncnnc	900
canntnnnnn	nnnnnnccnt	cnanaccntn	nnntctatn	ccc		943

<210> 429

<211> 775

<212> DNA

<213> Homo sapiens

<400> 429

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tcnncgcgag	naangctgtg	gcgtccatt	gtgaaagatc	caggcatttt	tccgagccag	120
gaaaagccca	agatgactac	aggatattag	tgcatgcacc	ccaccctcct	ctcagtgtgg	180
tacgcagatt	tgcccatctc	ttgaatcaaa	gccagcaaga	cttctctgct	gctgtgatct	240
gcacaccctc	caacctgggc	agggactggg	gggatgcagt	gtgtgttagt	gccccgtgg	300
cattgtggca	ctgttgcccc	ccatggcggc	atgggcaaga	tgaccttcca	ttagcttcaa	360
gtcttgttct	cttgtctgtg	gtctgtttaa	tatgtgggtc	actagggtat	ttattctttc	420
tcccatcctt	acactctgga	tcattgtgca	gacttaataca	gggttttaac	gctttcattn	480
nnnnnnnnnt	ttttttgagc	tcaaagaaag	ttctcatttt	ccctattcaa	ctaataccca	540
tgccgngttt	tttaccttgg	atttaaaggc	accttangtt	ggggcaacag	attctcactc	600
atgtttaana	cctggnatte	ancctcataa	gaccaaaagan	ggagctttcc	ctttctcttt	660
acccctnagg	attctcatcc	tttacannnt	gactttttcc	aggccaattt	cccatnnaat	720
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<210> 430

<211> 763

<212> DNA

<213> Homo sapiens

<400> 430

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tcgttctttc	tccangc	agn	nnngcgtt	tc	gcgacag	ctc	tccaata	actc	agg	tta	120
tgaaaaatca	tccaagac	ag	ttattgca	ag	agttta	aattt	ttgaaaa	ctg	gctact	gctc	180
tgtgtttaca	gacgtgtg	ca	gttgtagg	ca	tgtagct	taca	ggacattt	ttt	aagg	ggccag	240
gatcggtttt	tcccagg	gca	agcaga	agag	aaaatgt	tgt	atatgt	cttt	tacc	cg	300
attccccttg	cctaaata	ca	agggtg	gag	tctgcac	ggg	acctatt	aga	gtattt	tcca	360
caatgatgat	gatttcag	ca	gggatg	acgt	catcat	caca	ttcagg	gcta	ttttt	cccc	420
cacaaaccca	agggcagg	gg	ccactctt	ag	ctaaat	ccct	ccccgt	gact	gcaat	aga	480
cctctgggga	gctcanga	ag	gggtgt	gctg	agttct	tata	aagctg	c	catat	attt	540
gtagacaagt	atggctc	ctc	cgtatct	cct	cttcct	tagga	gaggag	tgtg	aaca	aggag	600
ttagataaga	cacccctt	aa	accatt	cccc	ttttcc	agga	gacctac	cct	tcac	aggc	660
aggccccaa	atgaga	agtc	tgctac	ctca	tttctc	atct	ttttact	aaa	ctcaa	angca	720
ntgacagcag	tcagggac	ag	acattc	at	ctt	nata	acct	tcc			763

<210> 431

<211> 761

<212> DNA

<213> Homo sapiens

<400> 431

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tctntctcna	cnngcn	ngg	cgtn	cg	aat	tcggc	acgag	cttga	agcgc	tggtttt	120
cgaagcaatc	cttatt	tatat	tgtaa	aaca	aa	gaa	gatca	accag	atggc	aacagc	180
gattctcaga	gattaa	agct	atta	agaga	aa	gtagc	tggt	ctag	agtga	tgacga	240
aagggaagaaa	gcatct	cctt	aatgaa	agaa	aa	cagag	gggca	aacggg	aaaa	aatca	300
ttgttaaaat	acattg	aaga	gagatt	acat	actct	agag	g	aagaaa	agga	agaact	360
cagtatcaga	agtggg	ataa	aatgag	acga	gcct	ggaat	atacc	attta	caat	cagg	420
cttaacgaga	ctcgtg	ccaa	acttg	atgag	cttt	ctgcta	agcg	agag	ac	tagtgg	480
aaatccagac	aatta	agaga	tgct	cancag	gatg	caagag	ataaa	atgga	ggat	atcga	540
cgccaagtta	gaga	attgaa	aacaaa	aatt	tcag	ctatga	aaga	agaaaa	aga	acagctt	600
aatgctgaaa	gaca	agaacn	gatta	agcag	agg	actaant	tggag	cttaa	agccc	aagat	660
ttacaagatg	aactac	cggc	aatag	tgaac	aaag	gaaaacc	gtttt	tttaa	agaa	angccn	720
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<210> 432

<211> 748

<212> DNA

<213> Homo sapiens

<400> 432

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tcaatgagtt	aaagact	gca	gaacaa	atca	acgag	catgt	ttcagg	cccc	ttt	gtgcag	180
tctttgtcaa	gattgt	gggc	cattat	gctt	cctat	atcaa	gcggg	aagca	aat	gggcaag	240
gccacttcca	agaa	gatcc	ttctg	taagg	ctctg	acctc	caag	accaac	cgcc	gatttg	300
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agaatcctcc	tg	caggctat	ttcca	acaga	aaata	cttga	atatg	aggaa	caga	agaaac	420
agaagaaacc	aaggga	aaaaa	actgt	gaaat	aagag	ctgtg	gtga	ataaga	atgact	tagag	480

ctacacacca	tttctggact	tcagccctg	ccagtgtggc	aggatcagca	aaactgtcag	540
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gtctgagatt	tggatccctg	gnattggatt	tcttaaggac	ttttggangg	ctcttgacac	660
catgcttcac	agaacttggg	cttcanaagc	ttcanttttt	tgcanagggtg	ccccagggtta	720
ggaaaacagt	tntncttggt	ttgtannt				748

<210> 433

<211> 769

<212> DNA

<213> Homo sapiens

<400> 433

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actcgcacca	canannnagt	gncntgngct	gttttgcaga	tgaggaaaac	tgaggtacag	120
aattcttagg	gaacttaccc	aaaatggctt	ttctgcactc	tgccctttgg	tattgtccca	180
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tcacttttgt	tgtttggctt	taaaattagg	aactttttctt	catctgggct	tcatttcctt	300
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cgttggaact	cacctgtgtg	ttnggacana	ngctgattgg	attttaccca	tcatacacanc	720
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<210> 434

<211> 764

<212> DNA

<213> Homo sapiens

<400> 434

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taaataaatt	tctgcccagg	aaacnttncc	aagccccaac	cagcaagcca	acccttaaaa	660
aaaaaatcac	ttcgtgttcc	ccaangggan	ctttnttaaa	gctttggggg	cttccaggna	720
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<210> 435

<211> 755

<212> DNA

<213> Homo sapiens

<400> 435

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aaatctgacc	catttaaagg	agctgacccc	ttcaaaggcg	acccgttcca	gaatgacccc	180
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tttacctcgg	atccattcac	gaaaaaccct	tccttacctt	cgaagctcga	cccctttgaa	360
tccagtgate	ccttttcate	ctccagtgtc	tcctcaaaag	gatcagatcc	ccttggaaacc	420
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ggnaagtctg	ggacattggg	accaccctgg	ggggaagaac	ttgtgggatg	tggcttttct	720
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<210> 436

<211> 760

<212> DNA

<213> Homo sapiens

<400> 436

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gctgcagata	accatgtgga	cttctgtcat	aattcttgc	gagtcaagag	tgtaaataaa	300
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ccttaaaaag	tcatagattt	gtgctgctgc	cagaattata	ttaattatta	ttaatgggat	420
tattagaaaa	aaaatttctg	gagtgagagt	naagangctt	aattagtttg	tgggcagttt	480
tcatatgctc	tgtgaaatgt	gtccagatgt	gacataagtt	ttttttttta	atatggngga	540
aatgncttct	ctttccatt	cttttctcct	aaaaatcata	tatactggga	atatatgcct	600
ctnttacctc	tattaccctc	ctcacattta	ccctttccca	gttngggttt	gctttttnac	660
caaaaagatt	ccaatnccna	ggtattggca	agttntnaaa	accgcccntt	aaacatccct	720
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<210> 437

<211> 748

<212> DNA

<213> Homo sapiens

<400> 437

ggnnnnngnn	ngntnncgtt	ccctattant	caggngctcg	ntctntctcn	annnancnng	60
gcgtgtncga	attcggcacg	aggattttcg	aaactcttca	gctacttgcc	ctttttttatc	120
tgaaccatc	ataccttctg	aaagaaaaaa	gcatactctc	attgacataa	cagaagtggag	180
atggccaggt	cttgatacag	atgggtccatg	atatatatgg	agagtggcat	tgtgaagata	240
acatctttag	atgggtcatg	atacctctgc	ctgcccagat	ctcagcatga	atttacagta	300
cattttttgt	gtaaagttag	ccagaagtca	gactcatctg	cagtgttgct	agaacaaat	360
aataaagccc	caaaaagataa	actagttgaa	aaaactggca	aaatctgtat	acgtggaaat	420
ttaccaggac	agagactgaa	gaataaagaa	aatgagtttc	attgccagat	catgaaatcc	480

aaagaaactt	taaagaagat	gagttgtgta	aatggaactg	aagggagggg	aagaactgcc	540
ttcgccctgg	acaaagcaca	catgtgtata	cacatgggtc	aagcagtgtc	ggtctgtggc	600
tgncgtgtcc	gangaatgga	aatatccctg	gctttagcac	ttcattttca	taataaaaac	660
agcaattntg	tctaaaaaaa	aaaannnana	aaaaactnga	gcctntanaa	ctntagtgag	720
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<210> 438

<211> 823

<212> DNA

<213> Homo sapiens

<400> 438

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tttgcccagg	aattcaaggc	cgcagtgagc	tatgattgca	ccactgcact	ccaggcaaca	180
gagtgagacc	ctgtcttaaa	aaaagaaggg	agaaagtgtc	agatggatgat	gaggtctggg	240
ggggaaatag	agaatgggga	tcaggagtgt	ggatgggtgt	attccctcac	caagaggtga	300
catgttgagc	agggaaactg	ggaggtgagg	gtgtgacccg	tgtggaaatc	agggaaaagc	360
attnacgctt	gagggacagc	caatgcanag	gccgtgaggt	ggccagtgcc	actgagcagt	420
gagcttgagg	tagggggcan	gtgangaggc	tggagagcgg	ggcagacaaa	accaatatgc	480
ttatttaaaa	caaggttggt	ncagcacctt	tgccttaaa	ccttgagcct	gnaancntga	540
aaaatttggg	cacnttcaaa	agcanggang	gaaacccaaa	gaagattggg	agggaaaagc	600
ccttncttcc	ccttancagg	aaatgaagtt	nccacccttn	aaaacaggnc	caggaccttt	660
ttgggacctt	tttggccttt	tgggttcctt	gaatcctctt	ggtngcctnn	gaatnaaaag	720
gnaaaagggg	cctttaaggg	gggatcccat	tntttccaaa	attcaaaggg	ggctttccct	780
gggcttaccc	aaaatttctt	ggncttaant	aaaaaaattt	ntt		823

<210> 439

<211> 767

<212> DNA

<213> Homo sapiens

<400> 439

gnnnnnngntt	ctaagtctgg	nnnnnnnngg	taccctttcc	aaaacctggg	ctctcgtctt	60
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atctatcttt	aactctcttt	attgtgagtc	taaatcccaa	ttctgcagca	gatcagtaaa	180
ctcacagtat	ttttcctgtg	gaaatctatt	caataaggaa	accaagacag	gatantaaaa	240
tttaaaaaaa	ancaactttg	aattcccctg	cctaggtctt	ccagttgttt	tccagcgcat	300
acctcaggta	tgacttttgc	agccggggac	aaaattagca	ccttccgatt	ctctagtcca	360
aatgaacttt	ggctaataaa	aaaattatta	tactacataa	taaagttnca	gatagcagga	420
aatgcaagag	ctaggagatt	cctagattat	atctggccaa	gccaaatacc	ttaaaccatc	480
acctggaaat	cctctacccc	ctcttctgag	ataatttgcc	cagccctttc	ttcccacaca	540
ctcactcaat	gtcacccctt	tctaataccc	aaaactgttt	ttgtggcctt	ggtagcctat	600
agtagtttct	cacatctttt	cccctanact	tttctgtttt	cagtttcaga	ccaaaaaac	660
tcttcaactt	ttttccagtg	gggtcttcct	taccagtaac	tttaccactt	gnaatcttat	720
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<210> 440

<211> 752

<212> DNA

<213> Homo sapiens

<400> 440

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tcatcaagag	gaccatcttg	aaaatcccca	tgaatgaact	gacaacaatc	ctgaaggcct	180
gggatttttt	gtctgaaaat	caactgcaga	ctgtaaaattt	ccgacagaga	aaggaatctg	240
tagttcagca	cttgatccat	ctgtgtgagg	aaaagcgtgc	aagtatcagt	gatgctgccc	300
tgtagacat	catttatatg	caattcatca	gcaccagaaa	gtttgggatg	tttttcagat	360
gagtaaagga	ccaggtgaag	atgttgacct	ttttgatatg	aaacaattta	aaaatcgttc	420
aagaaaattc	ttcagagagc	attaaaaaat	gtgacagtca	gcttcagaga	aactgaggag	480
aatgcagctc	ggattcgaat	tcctggggaa	cacagtacac	aaagccaaac	cagtacaaac	540
ctcctacgtg	gtgtctactc	ccagactncc	tacgccttca	cgtnctcctn	catgctgang	600
cgcaatacac	cgcttcttgg	gtcangaatt	agaagctact	gggaaaatct	accttccgac	660
agaagagatc	atttttagatn	taccgaatga	anaaagcttg	cattagtgc	attgaaaggg	720
aaataaaaaat	tcctacagtc	naaaaaaaaa	at			752

<210> 441

<211> 775

<212> DNA

<213> Homo sapiens

<400> 441

gnagccngat	tccaaaacct	gggnnccgat	ccaatgcttn	ccaattactt	gggagctcnn	60
actngcncna	ncaanctngc	cntgccaatt	cggcacgaga	agnaggcgga	gcttgccagt	120
agctgagatc	gcgccactgc	actccagcct	gggcaacaga	gtgagactct	gtctcaaaaa	180
aaaaaaaaaa	aaatggaacg	cagggcaaga	actcgtnttt	ggaaggagat	gggggaaagg	240
ancggtatta	tacctatgtt	gnatttgcag	gcaaatgaga	tgganccctc	tctgtaaaga	300
agagtcattt	gtgcaagtag	acggggctct	tgggtgcang	ccctggaggg	gcacacaatt	360
gcctgnangc	ttctgtgana	tcggggagang	gaggagaagc	agtctcttga	caaaataaag	420
tattttttatt	cattngtatt	tattaaatga	aaaaacaatc	ccatgggtgtc	ccttgtgtgt	480
ggtggaacct	aatgactgtt	gaaataaagt	ctgngttttc	ccttcaaaaa	aaaaacnccn	540
anaaaaaaaa	ctcgagccct	ntaaaacctn	tnngngagtc	gnattacctn	anatcccnga	600
cnttgataag	gatccattga	tnaantttgn	cccaacccca	actnngaatt	ccnngaaaaa	660
aaattgcttt	atttgggaaa	tttgcnatn	ctttgcttta	ntttgnaccc	antttancnt	720
cannnnccaa	gttacnancn	ncaattgcnt	tcatttangg	ttcaagggtc	aaggg	775

<210> 442

<211> 804

<212> DNA

<213> Homo sapiens

<400> 442

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atctcnaann	aaaangcttn	cgaattcgcc	acgaggccac	ctgcactgag	gtctgggccc	120
ggggacaggg	tgtcttagcc	aggcttgtct	gcgcctcagg	gaagggtgag	cagcccaggg	180
accagatgca	agttgggtgg	ccccccacc	cntccnacgc	cactccccag	tgtgctgggt	240
cctaaccagt	cgctctatgg	gagcagtcag	ccttctctct	ctctcaggg	cagctctccc	300
acctgctgnt	ccccgcacac	agaacctcat	tgtcttgagc	agttgcttat	taccagttg	360
ttgaaaaact	agcatgtgan	ggccggggcg	ggtgggtcac	gcctgtaatc	ccaacgcttt	420
gggangccaa	ngcgggtgga	tcatgangtc	aggagatcaa	gaccatcctg	gcttaacacn	480
gtgaaacctt	gtctctacta	aaaatataaa	aaagtancca	ggcgtgggtg	tggtccctgt	540
agtnccaann	tacttgggaa	gctnangcan	gaanaatggc	ntgaacccaa	gaaggaagaa	600

cnttgcantg	aancttaaaa	ttgcgcccac	tggaattttca	aaccttgggc	cnanaanaat	660
tgaagaatcc	cgtcttaaga	aaaaaggaaa	aaanttttnc	ntntnnaaag	gcccggccac	720
aantnggctt	taacgcctg	gtaaatnccc	aancactttt	tggggaaggc	ccaaaggcaa	780
ggccnggatt	caatttttna	aggg				804

<210> 443

<211> 786

<212> DNA

<213> Homo sapiens

<400> 443

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nnccccaann	annnaggngg	ggngaattcg	gcacgagcac	cattttttatt	ttgatgctta	120
cactcattta	ttctgttttt	gtaaaacagt	ttcaagaatt	taaaaatcct	tccagttaat	180
agagcttttg	ttattatatt	ataattttgt	aaaccactt	tgtttttccc	actttaaagc	240
cacagggtcg	actcatggat	gatacctcta	ttgctgctgc	atgatgttca	agaccggccc	300
ttggctgttg	ttacagagat	gttgggcaga	gctatgcagg	tgtttcattg	ngaactctag	360
ctttgatcat	ggtaaaaagt	taaccctttc	tattttttta	tggtatgttat	accaactatt	420
cagaggactc	atacttcaaa	aatattagga	aaatctgtct	tatagttctc	taataaatat	480
ctgaaatctc	aagtacgaca	tgaaagaatg	tcagaccatt	gntattgggtg	aaagtcattt	540
gatgaatggn	aaattctatg	aaaagtaagt	ggatttgcat	ggattaatat	cagggaaaat	600
ttaagccttc	ccaagtgtga	ctggggccaaa	gagagccaga	tgccccagc	gcctgtgccc	660
ataaagttcc	cgaatcccc	aatgggtctc	nttttcaaaa	acttgggncca	gaccgggaaa	720
ataaaancat	tcntcataaa	ttcaannggg	gncctcanga	aacacnttcc	cccancaacc	780
cttngg						786

<210> 444

<211> 760

<212> DNA

<213> Homo sapiens

<400> 444

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gagttggagg	acagtatgaa	ccccattttg	actttgcacg	gaaagatgag	ccagatgctt	180
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ctgcaggagg	agccactggt	tttccctgaag	ttggagctag	tgtttgcccc	aaaaaaggaa	300
ctgctgtttt	ctggtataat	ctgttgccag	tgggagaagg	agattatagt	acacggcatg	360
cagcctgtcc	agtgctagtt	gcaacaaatg	ggtatccaat	aaatggctcc	atgaacgtgg	420
acaagaattc	gaagaccttg	tacgttgtca	gaattggaat	gacaaacagg	cttccctttt	480
tctcctatng	gtgnactctt	atgtgctgat	atnccatttc	ctagtcttaa	ctttcaggag	540
tttacaatng	ctaacactnc	atgatngatt	cantcatgaa	cctcatccat	gttcatctgn	600
ggcaattgct	taccttgggg	gntcttttaa	aaagtaccac	gaaatcatca	tattgcatta	660
aaacccttaa	aagttctggg	gggnatcaca	gaagacaagg	ccnaanttna	aagnggagga	720
atttttattat	ttaaaagaac	cttttgggtn	ggatnaaaan			760

<210> 445

<211> 761

<212> DNA

<213> Homo sapiens

<400> 445

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gccccnaggn	tcccangnag	ccnngcngng	ncngattcgg	cacgagattc	caaagggttc	120
aaagaacttg	gtcataaata	tgataatgag	aagacaaaagt	atztatatta	aaacagttta	180
gtagccttca	gttttgtgaa	aatagttttc	agcacagaaa	ctgacttctt	tagacaaaagt	240
tttaaccaat	gatggtgttt	gcttctagga	tatacacttt	aaaagaactc	actgtcccag	300
tggtgggtcat	tgatggcctt	tagtaaattg	gagctgctta	atcatattga	tatctaattt	360
cttttaacca	caatgaattg	tccttaatta	ccaacagtga	agcactacag	gaggcaactg	420
tggcattgct	tccttaacca	gctcatgggt	tgtgaatggt	ataaaattgt	cactcagata	480
tattttttta	atgtaatggt	atataagatg	atcatgtgat	gtgtccaaac	tatggtgaaa	540
agtgccagt	gtagtaactg	tgtaaagttt	ctaattcaca	acnttaattc	ctttaaaatn	600
cacanccttc	tgcctctgna	tttggaggtt	gtcagtncaa	ctcatcaaag	aaaactgcct	660
aatntnaaaa	tcatattntg	ggaataattt	ccctcttttg	tagtctgccc	aagatcctta	720
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<210> 446

<211> 770

<212> DNA

<213> Homo sapiens

<400> 446

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cgaactcgct	cnannagnaa	ggccgggnga	attcggcacg	aggccccgct	ccatgagcag	120
tgactcccca	gtctctcctg	gcaccagtcc	ccagggtctt	cctggttgta	gttcctgctt	180
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ggntatgtga	aaatgcagat	tcactgagcg	agactaaggc	atcagtgaact	ggctccttac	420
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caacagttta	tctcttatct	acctatgacc	tgcganctgc	caccaccccc	agntggngcg	540
cctttccaga	cagaaccagt	gtacatctta	cacgtattaa	atngatgtcc	cnggggctcc	600
cnaanangna	tcaaacaagc	ngggcctcga	ccaccttggg	cacatatccc	nanggacatc	660
annctggagg	ctngngncac	tggcattggc	cctnacccctn	ggcaaaataa	accttctaaa	720
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<210> 447

<211> 757

<212> DNA

<213> Homo sapiens

<400> 447

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gggagaggtt	ncattgagcc	gagattgcgc	cactgcactc	tagcctgggc	gacagagcaa	180
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ttcataaaca	ggtactgaag	gaagcagagg	catgtggagg	acttccccac	ctcgtgcagc	300
tatttgggcc	gtggcatctg	aaatttctta	tttcagagtc	accttcttga	tgaccttggc	360
agtgaactgc	agtcactctg	ttaggccttt	ccatggccca	cgtcaatgcc	ggtatttctg	420
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acaccacggg	catggaccac	agagattgca	tcttgtgagt	ctgtagaaat	ggtcaaggcc	540
ttgtctcttc	ttaagtccag	agctcangtt	aatgcaaaat	tttnccggnc	atctgtgctg	600

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aaatcccttt ggggaagctc ctggctggtt tctgttaggt aggacagcta cacgtncctgc 660
cctttattgg cttcttttca tgaagctcct gccatntacn aaacatgtct ccttctctga 720
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<210> 448
<211> 770
<212> DNA
<213> Homo sapiens

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<400> 448
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tcagctaata agaagggggc caagattgtg gacatcagct tctgatcagc aaatgactga 420
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cattttacag aggatagatt tggagtgtc cagacgacac taccagctat ccttaatact 720
ttgttgacac ttgcaagang cagtngaca agtactttaa cttcctcatg 770

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<210> 449
<211> 792
<212> DNA
<213> Homo sapiens

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<400> 449
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atnacttgnt cncancggnc tggcatcnac ncgncacacc tacntnagcg cntttagcg 180
caatatncac ctntnaaac ccnnnagtc cagggctctg ccnnnnnact gntcaactga 240
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atcttgagga agacaccatt cgtcccnga ttntgaccaa ncctcggat gtgnctatgg 480
gctcnattga ggnacaacaa ctnncaactgc nnataggcca tctcnnnan nctacacatg 540
ngactttncn nnnatntna aatgnnnana tgtctctcnc aagcatcacc cnetgtccct 600
ncgncntcnt ggaagacct ctgnncaact ganctccttc ntgnnnnnnn ngatnttnc 660
nnncnnaata tncntnccc aatgnccttg tnnngnatat atnangggnt ttccaatttg 720
ggntaattca ntcccnccg nannctannn nccatnaac cntcngngcc ttcttgnaac 780
cttttnccct gg 792

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<210> 450
<211> 848
<212> DNA
<213> Homo sapiens

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<400> 450

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caagttgntc	tctgttctag	aaagcagatg	tagtagacat	ctactgttgt	tgctgaaca	180
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tncccanng	nganccnnn	tancegnnan	naggccnnng	cnntngcnn	nnngccnnnn	600
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ngggnctnn	nnnnannnn	ccennccnn	cnnccnnnn	nggnaanncc	nnnnnnnann	720
annnngggn	nnnnnannnn	ccnnnnnnnn	cannncnnn	cnnnnngggn	nnnnncnnnn	780
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<210> 451

<211> 765

<212> DNA

<213> Homo sapiens

<400> 451

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tccctgggca	gcaccgcagg	gacagatatt	accgtcaaca	gtgtgattct	acttcctaaa	300
aaccctgagc	actttgttgt	gtgcaacaga	tcaaacacgg	tggtcatcat	gaacatgcag	360
gggcagattg	cagaagcttc	agttcttgta	aaagagaagg	tggggacttt	gtttgtgtg	420
ccctctctcc	cgttgtgaat	ggatctactg	tgtaggggag	gactttgtgc	tctactggtt	480
cagtcagtca	ctggcaaact	ggagagaact	ttgacagtgc	acganaagga	tgtgattggt	540
attgcacatc	accctcatca	gaacctgatt	gtcctacag	tgaagatgga	ctcctaaagc	600
tctggaaacc	ataattcaac	ttttcttttt	taaatcaact	cgaagcatg	tncttaaatg	660
aacatattca	tgtaangggc	tttttttttt	tgncactttt	ctaagcaa	agatggctga	720
attagtacn	gaataaat	gngaaaatca	tggttaaatn	ccaac		765

<210> 452

<211> 765

<212> DNA

<213> Homo sapiens

<400> 452

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ngcnnnggng	ctcgttctnt	ctncacgnng	ccngtgcggt	gnccgtctga	ttgaaagctg	120
ttcaggttta	tcatgcaaat	cctcgcctct	ggctacggct	ggctgaatgc	tgcatgtctg	180
ccaataagg	gacttctgaa	caagaaacta	aaggccttcc	cagcaaaaaa	ggaattgtnc	240
agtctattgt	tggtcaagct	atcatcgtaa	aatagttttg	gcatacacag	ctatacagaa	300
tactgtttat	aatgatgggc	agtcttcggc	cattctctgt	ccagtatgga	gtttgcagcc	360
atatgtctca	gaaatgcctt	gttgctgctc	ctgaagaaca	gcaagatcca	aagcaggaaa	420
atggggctaa	aaatagtaat	caattaggtg	ggaacacaga	gagcacgaaa	gcagtgaaac	480
ttgcagcagt	naaagccatg	atggagatna	attcattcca	gcttcacctt	cttctccatt	540

gagaaaacag	gaattagaaa	acttaaagtg	ctccatactt	gcttgcagtg	cctacgtggc	600
tctggccttt	gggtgatacc	tcatggcttt	gaatcatgcn	gatnaacttc	ttcagcagcc	660
caagctgcag	gatctcttaa	gttttgggac	atttatatgc	tgcagaaccc	ttatcttctt	720
cgaacngaatt	tctgtgcctt	tctcacttga	ccccgagaat	gtncct		765

<210> 453

<211> 833

<212> DNA

<213> Homo sapiens

<400> 453

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ntgcgattcg	aattcggcac	gagagaaacg	ttctcaggtt	gaccagctgc	tgaatatttc	120
tttaagggag	gaagaactta	gtaagtcatt	gcagtgcatt	gataacaatc	ttctgcaagc	180
ccgtgcagcc	cttcagacag	cttatgtgga	agtcaagagg	ctacttatgc	tcaagcagca	240
gatactatgg	agatgaatgc	actgaggacc	catagaatac	agattctaca	ggggattaca	300
agaacacat	gaaccttctt	gagcacccca	ggttttggca	ttagaaaatg	ggtaccocctt	360
ggttcaaaaa	tgaacaaaga	aagccttaga	tttggatggg	ggaacctgat	ctgtccagtc	420
tagaaggatt	ccagtgggga	aagtgtttcc	atttccttng	tcccttggtc	tggccaagga	480
aagcgaaagc	cctttcttga	anagcaaccg	tggatcattn	gaccaggaac	ttccttcttg	540
ggtattaagc	ttctttcaan	tggaaaggaa	aggttccang	gccaaaggaa	aaatggaagc	600
ccccaaacng	atgggtttca	ccctaantaa	cctcaattgg	aagggtcttg	accaagaacc	660
cnggaaaggc	nanccattgc	acccttaaaa	ncaaggaaa	tggaccacct	ttggggcttg	720
ncnttccntt	ccgaaccagg	ttgaaaangg	gcttgaaaaa	tggttgctta	ccaaaagggg	780
cgnacnttaa	tggcaccaat	tattcctntg	gacnnttttt	aatanccttt	ngn	833

<210> 454

<211> 737

<212> DNA

<213> Homo sapiens

<400> 454

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ttcggcaaaa	tcaatgtgga	ctgaacataa	atcacctgat	ggaaggactt	actactacaa	120
cactgaaacc	aaacagtcta	cctgggagaa	accagatgat	cttaaaacac	ctgctgagca	180
actcttatct	aaatgcccc	ggaaggaatn	caaatcagat	tctggaagcc	ttactattat	240
aattctcaaa	acaaaagaat	ctcgtctggg	ccaacctaaa	gaacttgagg	atcttgaagc	300
aatgatcaaa	gcttgaagaa	agcagtaagc	aagaagagtg	caccacaaca	tcaacagccc	360
cagtccctac	aacagaaatt	ccgaccacaa	tgagcaccat	ggctgctgcc	cgaagcagca	420
gctgctgttg	ttgcagcagc	agcagcggca	gcagcagcag	cagctgcagc	caatgcta	480
gcttccactt	ctgcttctaa	tactgtcagt	ggaactgttc	cagttgttcc	tgacctgaag	540
ttacttccat	tgggtgctact	gntgtagata	atgagaatac	agtaactatt	tcaactgagg	600
aacaagcaca	acttactagt	acccttgcta	ttcaggatca	aagtgtggaa	agtatncagt	660
aatctggaga	agaaacatnt	taaccaggaa	actgtanctg	attttacttc	caaaaaagaa	720
gaagaggaga	gccacct					737

<210> 455

<211> 718

<212> DNA

<213> Homo sapiens

<400> 455

ggnnnnnnntt	tnnnngttn	cntaaaaann	tgggtactc	gttctttctn	cangnagccc	60
ntgcgatncg	aattcggcac	gaggatgagg	agtgtttaat	cattgataca	gaatgtaaaa	120
ataaatagtga	tggaaagaca	gctgttgagg	gttctaactt	aagttocaga	ccagctagtc	180
caaattcttc	ctcaggacag	gcttctgtag	gaaaccagac	taatactgct	tgtagtcctg	240
aagagtcagt	tgttttaaaa	aaacctatca	aacgagtata	taaaaaattg	atccagttgg	300
agagatttta	aaaatgcagg	atgagctctt	aaagccaatt	tccagaaaag	taccagaatt	360
gcccttaatg	aatttagaaa	attctaaaca	gccttctgtt	tctgagcaat	tgctctggtc	420
ttcagactcc	tctagttggc	ccgaaatctg	gatggccttc	tgcaatttcag	aagccaaaag	480
gacgattgcc	atatgaactt	caggactatg	ttgaagatac	atcggaatac	ctagctcctc	540
aggaaggaaa	ttttggttat	aagttattta	gcttgcaaga	cctgttggtc	tcgtcgctgc	600
agtgtncaga	ggatagagnc	agaccacgtt	ctaaaacnga	gaaatcagaa	gacatttnca	660
gttatgtctc	caaaagttag	tntcagctgt	atgagttgac	tctgctgaaa	gtgacttg	718

<210> 456

<211> 739

<212> DNA

<213> Homo sapiens

<400> 456

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ttcgcttggg	aggctgagtc	aggagaaatt	gcttgagccc	aggagatgga	ggttgagctg	120
agccaagatc	atgccactgc	actccagact	gggcaacaga	gggagactcc	gtctcaaaaa	180
ctaaaaaaaa	aaatncattt	agtataccgg	ggggtggggg	ggagaaataa	tggtattttcc	240
tatgcgaaat	gacgtgtatc	cctgtaccca	tggttaaatt	taaatatact	gtgtctcttt	300
tgggagagcc	ttttagtaga	ggagtcttat	atgaagtctc	tcataagtag	ttcacttgag	360
ttttgcagtt	tgaatcttta	aaggagcttt	aattgacatt	tattatacca	attaagcttg	420
gaatggggca	atggatgcat	ttccaaaacg	tgtgaaagcc	taacagctta	tattgctgaa	480
tgagaatctc	ctgggtgtaa	tttancactt	agggaactgc	gtgaacactc	ccagccatta	540
tgatgctggt	accagcttta	ntgtntaaat	gccatganta	ttctttctgn	tctgttttgt	600
gctctcttgg	tncattttatt	ttacccttta	cngaataatt	tcttgtaaaa	tcnttaaaaa	660
tntttggcat	ttaaaagtcc	nntcttggan	tnaanann	nnnaaaaaa	ancttncccc	720
tttanaactt	tnngggct					739

<210> 457

<211> 743

<212> DNA

<213> Homo sapiens

<400> 457

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tggttgncga	attcggcacg	aggnnanagg	gnagctacat	gnntnaccnt	nttngnnctc	120
tcagccangc	tcnnctnnnn	ctggctcctac	tgctacatag	aacacttggt	ntncnnggna	180
actnntntat	gtnnccnnga	ntctctgnna	ctngtttaaa	tgctanttga	taacaggcta	240
tgcaaggnc	gnaagtggan	agcgctcatc	ttcatcatnc	ntnttanctn	gantnnntgt	300
atcctacatg	ctttgattgg	taaatngncn	tcagactggg	actctcaata	aatgnatata	360
gangancctg	ctgtggaaan	ctgtcctctc	ntatctntnc	atgngnaant	tccactncag	420
tntgaactcc	aaatgcnnnt	atnggnganc	cctncttgta	tagtggtgct	cattccaanc	480
tgcnagggnc	tagaaaaccgt	cggtctntng	aaacnatggt	gnagttgan	ctggtagang	540
cngttntcac	ctgcanctac	cataaaatgg	gnttacccaa	gctttatcat	ggaatggnta	600
taaaaaacgc	attnattgng	cctttntaan	cccattatnt	gttnaatttn	acttatggtt	660

ccccccattn aaattatnca attgggnann gangcttcna gtcnccatnt ttnaatggnn 720
 ttnncaaaaa aacgnttttt ttt 743

<210> 458
 <211> 906
 <212> DNA
 <213> Homo sapiens

<400> 458
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 ttggttaggn gctcgnnctn tctccacna gnnnngcggg gcgaattcgg cacgaggtg 120
 aatcaaggat cacaaactnc acatttngca cnttggctcn cacatncntg gttngggcag 180
 tcncagtnaa catggctntg gaaactnatn ttngnctngc ntcaaccatc tcgttccng 240
 gggaccann ntccnnnnc ncgnnttnc tcgnnnatng gagngctnct tngnccannn 300
 atgggctccc nanaatangn nttnncnnngn nnatncannc ncngncaann ggntcnnct 360
 nnnnnngccc tnttncctna tggnnngctn catgncccat nnnnnngggn ancaataann 420
 naaanggtct ntcccnnga nccccnnnnn ccnctaacan ngnacctcgc aaagggcccc 480
 aggcnttnc tngnaaacca nnttngccaa nggtanttca aaggngcct tngggacctc 540
 ccnannngc cntggnnnta ccccggnnaa anggtngnaa acccnnccnn ngntgccnnn 600
 cccggnccng gaaanaaatt tccnnggnac ccagnntncc nccgnaannn anantannnc 660
 ccncccnnaa cnttngccc ncancnttn gnnntgnaa tcnnccnncc cttttnnnntn 720
 nccaanncgg ccnggnnacn nctttnacc tnttncnncn naanngacnc caantcctn 780
 nannaagggt nggnnnnnnn nnncttnc nnggnagcc cnnnnnnccet nncntnnncn 840
 aaaaattcnn cnntgnancn cccctnnnt nangngccc natnnnnnnn nngnaaanc 900
 nnacc 906

<210> 459
 <211> 765
 <212> DNA
 <213> Homo sapiens

<400> 459
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 ctagngctc gntctngctc cagcgagncn gggcgtgggc gaattcggca cgagcttctg 120
 ttgattggtt tgtttaagt acctaagtac tacccttga ctccctacca aaagttcttt 180
 tgttttttaa acaacttta tttgtgactt actttcttga gaagngttct taatgaattg 240
 cataaaatag tggtagcagc ttatttctta agtncttnat tattggggct ttaccattca 300
 ggtcttatct ttaaccctta tttactcagt ttccatctg aatgatecta tctctaaatn 360
 aaggatttaa taaatgctgc aaattgtcca ctttgcaaat ngccaaaag ctttagtttt 420
 ggaccttgng aactttttt ttaataacac attatttggg cccggtcgtg gtggctcaag 480
 cctgtaatcg cagcactttg gaatgcctag gcagacagat cacttaangc ctggagtctg 540
 agaccagcct ggccaatgtg gtgaagacct cgggttctat tactaaaaat nctaaaaaat 600
 tancaaggca tggnggtgca cgcctgnaat ctcagctact tgagangcaa atcnggagaa 660
 atgcttgacc ngggangcan anatganccn anattgcacc actgcattcc acctggggan 720
 nanantgaga anctggctca aaacccaaaa acccaaaaaa aaaa 765

<210> 460
 <211> 677
 <212> DNA
 <213> Homo sapiens

<400> 460

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cctgaaacct	ggctgatggg	agaggtctca	ttttgtgtct	gagaatgtcc	aggttgtctg	120
cagaccacag	cactgatttc	ccattagcag	ttattatttc	ctggccattt	cttcctgaag	180
gttttgggt	taaactccct	gtcctcaata	ttttatcagc	agtagggctg	tcattcttct	240
ggttatcaac	ctctacatta	tgaagtaagg	ttcaaccctt	ctgcttttct	caggcccca	300
aaacggttcc	tatccaatcg	aacacaaaaa	cgggtattga	gaaggaattg	gcagggctca	360
gtggctgttt	ccgttgctcc	tacctcatgg	agactcttac	tcatgctgga	tttattgaga	420
gaacttctaa	ctgaccactc	acccccaccc	actcttatgc	agtctgttca	ttcctgaaaa	480
caccactttc	atccctcctg	cacacaaccc	atgagggatt	gctacttcct	ataagattcc	540
tcagtgagcc	ttatagagtt	gctgcgagaa	ttacatttgg	tcatgatgtc	aagtgtctgg	600
tatgtagctn	atgcttattg	aacacatagt	aattttattg	aataattgnc	atgatcactg	660
gatgagaata	tagcccn					677

<210> 461

<211> 787

<212> DNA

<213> Homo sapiens

<400> 461

gnnnnnnnag	ggnnnnngng	ggcctcncaa	agcccngncn	acaggtcccc	gttccaaagc	60
ntggnganc	gcnnccgccc	ancagnaagg	cgggggaang	cggcacgagg	acatcatcnn	120
cttattctag	taagagaaag	tacacagatt	caactttaga	gaggacnggg	gggnnnncng	180
gagcnaaatc	aaggaaggan	tatcacnggg	ccncccnnga	atataannnn	gaagctgnga	240
acagnaccat	cagnaacann	nnatggacag	ctctgatggg	gnnnatacca	cggcactctn	300
cnnaccnnng	gnggaagcna	tccggagnna	tgactgangn	gnaaagnggn	nnactgnnag	360
aanccnggng	ngctaggann	ctgggagagn	cactttcang	aagnnaccng	gcgangagnc	420
atcanaagaa	cccgganaag	ngagaagacn	ggaaaaagnn	cncancgnac	ngagcccagn	480
nannnncnct	gagccanggg	ctncgaaang	ccccaccnga	agcnccatca	canggnacaa	540
ggnnngggaa	aaggaancna	cnnngcngac	angnccncn	aanagngcca	aancacngcn	600
nngccncnc	gccc aaagaa	nacnggacng	cnggcncnna	ncanaaggag	cncnanggcc	660
cnnngnaang	aaactncnag	nagcccaanc	ccaaaggccc	cnangganng	ccnncaaggg	720
gaaaacanna	nnacccaag	gggcctgggc	naanaaggcn	nccacncng	gccnccnnc	780
nnnaccg						787

<210> 462

<211> 747

<212> DNA

<213> Homo sapiens

<400> 462

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ccannnagnn	nntgcgttng	cgaattcggc	acgagcctca	gccccacacc	agctctattt	120
caggggtgag	agtcagagag	cactgcaata	tgtgttcat	gggatttcga	ttcgaagatc	180
ctagaccagg	gagacactgt	gagccaggga	tacaacaaaa	tactaggtaa	gtcactgcag	240
accgacctcc	ctgcagtgtg	ggaaagaagc	tgggtttgtg	gagaatcaga	gcattctgac	300
atgactgctg	acctaagat	ccctggcatt	ggccagggat	cctgtggaac	ctcttctagt	360
tcaggggtgt	gagcattaga	ctgccagtgt	tctagtgaac	tctgatgctt	gctgtgaact	420
tttaagatcc	ccgaatcctg	agcacctcaa	tctttaattg	ccctgtattc	cgaagggtaa	480
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tttctttcct	tctccctttc	ttctttgcct	tctaaatata	ctgaaatgat	ttanatagt	600

gtcaccaatt aatgatcttt tattcaatct aagaaatggn ttaagttttt ctcttttagct	660
ctatggcatt tcaactcaagt gggacagggg aaaaagtaan tgccatnggc tccaaaagaa	720
tnntttatgt tttagctatt taaaaaa	747

<210> 463

<211> 750

<212> DNA

<213> Homo sapiens

<400> 463

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tctncannca gncnntgctg tgccaattcg gcacgaggcg agatgaagct acactgtgag	120
gtggagggtga tcagccggca cttgcccgcc ttggggctta agaaccgggg caagggcgtc	180
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gagcaattct tcaccaaatt tgtagatgag gggaaaagcca ctgttcggtt aaaggagcct	360
cctgtggata tctgtctaag taaggattcc atatggctct catatcattc cattccatct	420
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cattcaagga actactacca tgaatctgca ttctgntgcc cactactgagg ncttagtaga	540
taattgggtg gtctgaaaca cctattatct cttatntctg gtctctangc tggnatgtta	600
attcctctga aatgntaaaa gtaatgggtg anaccngaaa aagaaatttc aatnacagat	660
caanntgggg ngcatgtatn attttcaagc gtcaaaatgg aataaggga gantnctgga	720
tacctgcttg gaaaaggaag natgtgtatn	750

<210> 464

<211> 748

<212> DNA

<213> Homo sapiens

<400> 464

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tacgcagnnc ccatcgattc gaattcggca cgaggccggc cggcgacgct ggcgacgctt	120
tcgcccctga ggtagtgttg cgaccgcgaa gaaggaaaaa gggcgggcgg gcggctgtcc	180
tctcaccgtc ctcacccgcg gagggccggc ccgctcctcc gtctgtgatt tcgcgcgat	240
ccccccggca gctctttgca aagctgcttg aaacttctcc caaactcggc atggatacga	300
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gggctctgaa gtttcaccag gtggacgctg gggagcgggc tcccagcac ttgtctacct	480
nccgccagtc ctgacaactt ttctggccta cctaccagc ttcgcttggc tggcgagcgc	540
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aagacgggaa aagcgacagc cacgctnctg gcttgaagcc gcaggacgca aataacttac	660
tttgacctg acagttctac gttgntgttg angccctgtt tcctggaaat aaaactcaaa	720
atggtggttt ttggaaaaa aaaaaaat	748

<210> 465

<211> 863

<212> DNA

<213> Homo sapiens

<400> 465

gggnnnnnnn aangnnnnn ggnnnnngtc ccgttccaan gaccnngaga tcgnngnccg	60
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tccanaagaa	aggcgggtgng	aattcggcac	gagacctgta	ccgcctggcc	actggctgtc	120
accggcggtga	tgagctgccg	gtgtttgaac	gcngcctatg	cngggacttt	cccggcanan	180
nggcnnngaan	atggccncca	tncaggaagc	cgcccagaac	ctcctngggn	acacnacttn	240
agngccttcn	agtccgntgg	nacccggnc	aagccccggc	aancnctgcc	ccgggtcncc	300
gttcccaagg	ccaaccagcc	ctgggnaccc	ccggggagcc	gaaacnctgg	ggctnggana	360
ccngngantga	gagncnact	tttcnntgta	nacacgggcc	cagganacan	ctntgctcgt	420
ggccccgggg	naaannnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	480
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	540
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nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	780
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	840
nnnnnnnnnn	nnnnnnnnnn	ncc				863

<210> 466

<211> 713

<212> DNA

<213> Homo sapiens

<400> 466

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gcntcatggg	atttcgattc	gaagatccta	gaccagggag	acactgtgag	ccagggatac	180
aacaaaatac	taggtaagtc	actgcagacc	gacctccctg	cagtttgagg	agaagctgg	240
gtttgtggag	aatcagagca	tcttgacatg	actgctgacc	taaagatccc	tggcattggc	300
cagggatcct	gtggaacctc	ttctagttca	ggggtgtgag	cattagactg	ccagttgtct	360
agtgcacatc	gatgcttgct	gtgaactttt	aagatccccg	aatcctgagc	acctcaatct	420
ttaattgccc	tgtattccga	agggtaatat	aatttatctg	gatggaaatt	ttaaagatga	480
atcccccttt	tttcttttct	tctctctttt	ctttccttct	ccctttcttc	tttgcttctt	540
aaatatactg	aaatgattta	gatatgtgtc	aacaattaat	gatcttttat	caatctaaga	600
aaatggttta	attttttctc	tttactctat	ggcanttcac	tcaantggac	aggggaaaaa	660
agtaattgcc	atgggcttcc	aaaagaattg	ntttatgntt	tagctatttn	aaa	713

<210> 467

<211> 732

<212> DNA

<213> Homo sapiens

<400> 467

gnnnggtntt	ctaattcctg	nnnnnnnnnt	ncccttctaa	gcntggngnt	cgnetnnccn	60
acnancnggc	ttncgaattc	ggcacgaggc	gagatgaact	acactgtgag	gtggaggtga	120
tcagccggca	cttgcccggc	ttggggctta	ngaaccgggg	caagggcgtc	cgagccgtgt	180
tgagcctctg	tcagcagact	tccaggagtc	agccgcgggt	ccgagccttc	ctgctcatct	240
ccaccctgaa	ggacaagcgc	gggacctgct	atgagctaag	ggagaacatt	gagcaattct	300
tcaccaaatt	tgtagatgag	gggaaagcca	ctgttcgggt	aaaggagcct	cctgtggata	360
tctgtctaag	taaggattcc	atatggctct	catatcattc	cattccatct	ctgccaaagt	420
ttggataccg	caaaaatttg	tgtttgtgga	agattctgtc	tgaactcttt	cattcaagga	480
actactacca	tgaatctgca	ttctgntgcc	cacactgtgg	tcttagtaga	taatttgggt	540
ggtctgaagc	acctattatc	tcttatttct	ggtctctagg	ctggatgttt	aatcctctga	600
tatgttataa	gtaatgggtg	agaccngaaa	aagaaatttc	aatacngatc	aantttgggg	660

tgcatgttga atttgcaacc tcaaattgga gtaagggaan attctggata cttgctggaa 720
aggaggaatg tn 732

<210> 468
<211> 748
<212> DNA
<213> Homo sapiens

<400> 468
gnnagnnttc taatngcttg tnnnnnnnna gacgttctaa nnctttggcn atcgtnnttt 60
ctncagnann ccntcgattc gaattcggca cgaggccggc cggcgacgct ggcgacgctt 120
tcgcccctga ggtagtttgg cgaccgcgaa gaaggaaaaa gggcggggcg gcggctgtcc 180
tctcaccgtc ctcaccccg caggcccggc ccgctcctnc gtctgtggatt tcgcggcgat 240
ccccccggca gctctttgca aagctgcttg aaacttctcc caaactcggc atggatacga 300
ctgcggcggc ggcgtgcct gcttttgtgg cgctcttgct cctctctcct tggcctctcc 360
tgggatcgga ccaaggccag ttctccgcag gttggttgct tctttcgttc tctcctctgg 420
gggctctgaa gtttcaccag gtggacgctg gggagcgggc tcccgagcac ttgtctacct 480
tccgccagtc ctgacaactt ttctggccaa cctaccagc ttcgcttggc tggcgagcgc 540
atctgctgct ggggttcgcy gtgcagatgg agacgcantg gtggccagag ggtgatggag 600
aagacgggaa aaagcgacag ccaagctcct ggctgaaacc gcaaggacgc aaaataactt 660
actttgnacc tgacagtttc tnacgtttgt tgtggangcc ctgtttcctg ggaaataaac 720
tcaaattggt ggtttcttgg aaaaaaaa 748

<210> 469
<211> 776
<212> DNA
<213> Homo sapiens

<400> 469
ggngntcta atgcttgnnn tgattctcgg tctataacng gntaatnctt ggnccctacna 60
aaaggctang ngaattcggc acgagacctg taccgctgg ccaactggctg tcaccggcgt 120
gatgagctgc cgggtgttga acgcaaccta tgctggactc tcccggcaga ctgcctggat 180
atggctcgcca tgcaggaagc cgcacgacac ctctcggca cacacgactt cagcgccttc 240
cantccgctg gcagcccggg gccgagcccc gtgcgaacgc tgcgccgggt ctccgtttcc 300
ccaggccaag ccagcccctt ggtcaccccc gaggagagca ggaagctgcy gttctggaac 360
ctggagtttg agagccagtc ttctctgtat agacaggtag ngaggatgac ngctgtgctg 420
gtggccgctg ggcttnaann tnnnnnnnnn nnnccnnnac caantctnnc nannnnnnnn 480
ccnacnnnta aaantnnnnc nnnnnnnncan nnnnnnnnnc cnnnnanncc nnnncttnnn 540
naancnnnnn nnnnnnnanc nnnncancna nnnnnnnnna nnnccnnncnn nnnnnnnncn 600
nnnnnnnnnn nannccnnnn nnnnantnnn nnannnnnnn nnnnnnnnnn aaannnnnnn 660
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnccnnnnn nnnnnnnncnn nnnnnnnnnn 720
ccnnnnnnnn nnnnnccnnn nnnnnntnnn nnnnnnnntn nnnnnnnnnn nnnnnnc 776

<210> 470
<211> 765
<212> DNA
<213> Homo sapiens

<400> 470
tatgnntttt ctaaaatnnc tgggcaanac gtectcnctt tectaanaagn ttnggcanaa 60
cccttggcaa nacgcngtn acccanacnc agnnnggccg tggcgggcga gcgggcaaca 120

gctcttgagg	agtgagactg	cnggagatnt	gggccgtgcc	aaagagatgg	atgagactgg	180
tgctgagttc	atcaagagga	ccatcttgaa	aatcccatg	aatgaactga	caacaatcct	240
gaaggcctgg	gattttttgt	ctgaaaaatca	actgcagact	gtaaatcttc	gacagagaaa	300
ggaatctgta	gttcagcact	tgatccatct	gtgtgaggaa	aagcgtgcaa	gtatcagtga	360
tgctgccctg	ttagacatca	tttatatgca	atttcatcag	caccagaaag	tttgggatgt	420
ttntcagatg	agtaaaggac	caggtgaaga	tgttgacctt	tttgatatga	aacantttaa	480
aaattcgttc	aagaaaattc	ttcanagagc	attaaaaaat	gtgacagtca	gcttcagaga	540
aactgangag	aatgcannct	ggattccaat	tgcccgggga	acacagtaca	caaagcccaa	600
ccagtcaaac	ctacctacgn	gggggactac	tccagactcc	cgnacncctt	cacgtcctcc	660
tccatgctga	ggcgcaatca	cgcgttctgg	gncaagaagt	tanaaacnct	gggaaaaact	720
acctncgaca	agaaggggan	catttanatt	taccnnaaat	gaana		765

<210> 471

<211> 820

<212> DNA

<213> Homo sapiens

<400> 471

cnnnnnngggn	nnngnggcgn	cntccnaaan	ccggggcgac	agngccnnng	ttccaacaga	60
ccngngnggc	cgncngngcc	ccanacagca	ngggnggggc	nnngggggnn	cnncgncnnn	120
cnnancnaca	aagaactcaa	caagaaaaaa	acnaacccca	caagcgggca	aaggacgnga	180
acagacantn	cccaaaagaa	gacatacaag	caaccnaaaa	taatcnaaaa	taagnnncaa	240
aaagaaaaaa	ngcnagacag	agnngngana	gnactnagna	aaaagngana	tctagcggcn	300
annagnangn	nngnnnacgg	ncngnnncna	agaaanagnc	nctggnnccc	aagcnggagn	360
acagcggcgc	aagcnnngcn	cactgcaacc	gcgaacnccc	gggctcaagc	gaaccnccag	420
cctcagcctc	ccaagnagcn	gnnaaaggca	ngcaccacca	caccgacna	aaatanengc	480
nancaanaac	ananaanggc	nccccngngc	nnanncagga	aanaaacacn	cnnangcnnc	540
ngaaaaanaa	naancncncn	cnnnacaaaa	aaacnnnagc	cnnagaacaa	nnnnggaggc	600
ggaanacggn	nnancccgac	anganaanga	nacnanngan	gganganngg	gaccaaaccn	660
cancccgggg	anggcnnngn	aaaaaaaang	ccnnnaaann	gggggaaaaa	ncggngnang	720
ccnaaagggc	cnnaaanggg	gaaaccnanc	naaaangccg	ggcanannan	aaccnagcnn	780
nancnanccn	nccaangggg	nannnccncn	nncnaggccg			820

<210> 472

<211> 738

<212> DNA

<213> Homo sapiens

<400> 472

gnngtgtctc	taatgcttgg	ctactngttc	tttccgcoga	acncttgcta	atgcttggcn	60
ntcgttcttt	ctccacnnac	nnngcnntnc	gaattcggca	cgaggtcaca	ganatnaaag	120
tccaatcata	ggggctggnc	cnactctnt	gctntccct	gcangantca	tangatcagn	180
nanaccgtgc	gnntttgnaa	gcntttcaaa	tgtgntacca	tcgngttact	tncnnnggca	240
cctgntgann	tnggttgnac	tnnncnngat	netccaaanc	caccnnnnnc	atgggntnng	300
tgngcatgng	ntggnncann	nacagannna	ganactttaa	ngaannngnt	tntgcaaccn	360
tnggnnctag	caancntgan	antnccaggg	nnggccacna	agctgaaaat	nnatgttana	420
ncnnatgntg	naatctctag	natgacttcc	ncannnancn	aaactnangc	anggtgcna	480
tgtagaanc	tanaggccna	atttcttntc	natgnaacca	ntntatgctt	ttaagacctt	540
caactgttnc	natgaagccc	atntacatna	ttncggtaat	anggtctatnc	ttaaannnaa	600
ctgctgaaaa	tnatgatnca	nctacgaaat	cctnncanc	ncatntggct	naatcattac	660
caaccatttg	acaccnncat	ngnctaccca	cntgcattnc	catgaccnan	tccantgcca	720

cccgcncaga tntacctt

738

<210> 473

<211> 752

<212> DNA

<213> Homo sapiens

<400> 473

tatgnntncc	taanagagtt	ntgnnacacg	gcccgccttc	tnaaancttc	ctaatncttg	60
ggcgctcggt	ctntctncac	ncagnnnntg	cggtncgaat	tcggcacgag	gtccttttga	120
accaccccaa	agaactcaac	atggcaaagc	aaatggtaaa	agcttcccga	ctgttctact	180
ttgggtccgc	gcgaagccca	ctcacgtgtg	atctgtgttg	cccctgggag	gcccggggcg	240
accggaagag	ggctctctca	agttctgaaa	agagaatctg	ccaccagatc	gaatttcgac	300
ccctgagctt	gttcggacgt	atggtccaaa	ttcagattaa	ggtggtcacc	caacccgaga	360
tgtcaggaaa	ggccttctgc	agagaaaatg	tccccccacc	cgccatctgc	agccagggtg	420
gtgccacacg	gcagccttcc	cgaaacatag	tatggatttt	aaaaatgtgt	ntatttttgg	480
ttctcaacca	ctttataacg	tattttttta	tttattttgt	aatgtcttgt	tttgaagtat	540
tgctgctatc	cttggtatcc	ttcccactgg	ttttatcact	ganttatttt	gngaaagttg	600
ncactaatgt	tctatgtcaa	aatcaaaagt	atttaatgaa	atactanntc	tattttaatgt	660
ggntatggaa	ccagctggaa	acacaaaaca	aacagtgatt	gacancaagc	tgggcccgaag	720
agncagggtca	ttttgnacat	atgccaataa	ac			752

<210> 474

<211> 752

<212> DNA

<213> Homo sapiens

<400> 474

ttgcanacnn	aatanttgct	gtaaaagtcc	cnnctttttt	ccctttctaa	tgnttgngcg	60
ctcgnctctnt	ctccacnagn	nnntgcgttn	cgaattcggg	tctnagccca	tgccggggtc	120
ttcccacacc	cgtcctcaca	gatccagccc	cagccctgtg	cttcccaggc	catctctcag	180
cagcacctgc	aggatgcggg	caccggggag	tggagccctc	agaacgcac	catgtcggag	240
tctctctcca	tcccagcttc	cctgaacgac	gcggcttttg	ctcagatgaa	cagtggagtg	300
cagctcctga	ctgaaaaggc	cctgatggag	cttgggggtg	ggaagccgct	tccgcacccc	360
cgggcggtgt	tcgtctcctt	ggatggcagg	tccaacgctc	acgttagaca	ttcatacatt	420
gatctccaaa	gagctggaag	gaacggaagt	aatgatgcca	gtttggactc	tggegtagat	480
atgaatgaac	caaaatcanc	ccggaaggga	angggagatg	ctttgtctct	gcagcagaac	540
taccgnccg	tccaagagca	ccancagaaa	gancctcanc	cccagacagc	acggnctaca	600
cgcanctcgt	gnacctggat	gacntggaac	anaatgggtan	cnaatgtggg	accacngmct	660
tgtanccena	ggacaaggcc	ctncnangct	tgntggangg	gtcnantcng	anaaatggng	720
gccactgccc	aaccgcgag	aaganaacaa	nn			752

<210> 475

<211> 742

<212> DNA

<213> Homo sapiens

<400> 475

gntttctntt	aatncttttn	naaangcggn	ntttacntt	ctangnntgn	gnctcgttct	60
ttcccacnna	nnnnncggt	cgaattcggc	ncgaggtgaa	acagaaagt	gagatgcttt	120
ccttgacctg	aagaagcctc	ctgcctccaa	atgcccccat	cgctatacaa	aagaagaact	180

cttggatata	aaagaactcc	cccattccaa	acagagcctt	catgcctttc	tgaaaaatat	240
gacagtgatg	gtgtctggga	ccctgagaag	tggcatgcct	ctctctaccc	agcttcaggg	300
cggagctcac	cagtggaaaag	tctgaagaaa	gagttggata	cagaccggcc	ttccctgggtg	360
cgcaggatag	tagatccacg	agagcgtgtg	aaagaagatg	acttanatgt	tgttctcagc	420
cctcagagac	ngagcttttg	agggggcgtc	cacgtgacag	ccgctgtcag	ctcccggcgc	480
tcangaagtc	cattagagaa	agatagtgat	gggcttcgtc	tgcttgggtg	acgtaggatt	540
ggcagtggga	ggataatctc	tgcccggacc	tttgagaagg	atcaccgctt	aacgataagg	600
acctgcggga	cttgagagac	agagaccnan	anaaggactt	caaggacaac	gtttcangan	660
anaanttttg	gagaaagtaa	ncntgtcttt	tggtgancgt	anaanaaat	gattcttact	720
cnnaanaaga	acccgaatgg	tt				742

<210> 476

<211> 1122

<212> DNA

<213> Homo sapiens

<400> 476

gnnnggggnn	ttctaaaagc	tgggnnnnnn	nnngagggnnc	ttctaattct	tctaattggtt	60
ggctctcggt	ctttctncac	gcagcnnngc	gnnncgaatt	cggcacgagc	ctgcagccac	120
taatgcattg	tgtatgataa	caaaaactct	ggtatgacac	attttctgng	atcattgnta	180
attagtgaca	tagtaacatc	tgtagcagct	ggttagtaaa	cctcatgtgg	gggtgggggtg	240
gggggtgtatn	cctngnggga	nggnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	300
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	360
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	420
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	480
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	540
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	600
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	660
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	720
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	780
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	840
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	900
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	960
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	1020
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	1080
nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	1122

<210> 477

<211> 747

<212> DNA

<213> Homo sapiens

<400> 477

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gtcgaactcg	ccccacncg	cnaggcgggg	gctncaagcg	attctaaacc	acctatgagt	120
atttctttta	gggctcactt	aaatacatgt	ntgngnntac	tgggggctag	ccngaataat	180
tttagatctg	atcaggtngn	ngctnaaatt	ngaaaaanac	cnnntngatg	cttaaagaat	240
tngcntccat	ttttgagtct	aaatctttta	aaatntactg	ngatccacat	ctagnгааat	300
gtcngtgtca	anatattctn	gatnatcgct	naaatccnca	ttaataactn	ttnggggttn	360
nnnatagngg	aacttcttag	nnntncnaaa	agcacatngn	cttctgntct	ccgctgctcc	420
cacagnnggt	nttgnaactg	ggnaaatcag	nnnnnngata	gcgngngnnt	ntnaganaaa	480

ntngatncac	acatncttnn	nnctcagnen	ncacatngat	tgaacactct	ggccaagatg	540
ctngngngga	tgangettga	gttcgannga	agaagccngc	gctggcctgg	cttgnaagac	600
ccnngncttt	cccntnccct	cnetngaaag	ctgcccngac	ngaggccnaa	ngnaaatggn	660
tganngnnen	gtcnngcccn	cttcngnenc	ttngaaccnn	nnagnggnnc	tnnnngnacc	720
cnngnnntn	cgngnaaccg	nncnngc				747

<210> 478

<211> 746

<212> DNA

<213> Homo sapiens

<400> 478

gnnnnnnngcg	cgnccttcta	atgcttenta	attnnctnng	atactcgctc	tttctncagg	60
nacnnntgc	gnntcgcaag	gagnagagt	atagnaattg	gcagtgaat	atacgaacca	120
ccctcctgcc	ctctgggttc	acaatacgtg	tacacttgac	tgtgaagtgg	ctgtgagagt	180
gggtggagag	ttcttctttg	accctcagcc	tgcggtgccc	tctagaaacc	tcgtgttgat	240
tgcaggagga	gtcggaatta	accctctgct	ttccatcctg	cggcacgcag	cagatctcct	300
cagagagcag	gcaaacaaaa	gaaatggata	tgagatagga	acaataaaac	tattctacag	360
tgcaaaaaat	accagcgaac	tcctgtttaa	gaaaaatata	cttgatttag	taaatgaatt	420
tcctgagaag	attgcatgca	gtttgcatgt	tacaaaacag	actacacaaa	tcaatgcgga	480
actcaagcca	tacatcacgg	aaggaagaat	aacggagaag	gagataagag	atcatatttc	540
aaaagagact	ttgttctata	tttgtggccc	acctccaatg	acagactttt	tctccaagca	600
actggaaaac	aaccatgtac	ccaaagaaca	catttgcttt	gagaagtggg	ggtaggaggc	660
aagaccaaaag	gcaggaaaaa	attaangagg	tgagatctac	tcaaggagag	ctcaaaaaaa	720
aaaaaaaaaa	actngggccc	tttaga				746

<210> 479

<211> 750

<212> DNA

<213> Homo sapiens

<400> 479

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ggatcccntg	cgattcgaat	tcggcacgag	ggtagactgg	ctagggatcc	tggaccagg	120
gttccacgta	gcaacacctg	ctgagttctc	tgggttttct	tcctgcctca	tgtagcccag	180
acttggagct	gaagaagctg	gaaacatgga	aacaccaaca	gctacagacc	aaaaaaagtc	240
ccaacaaaag	cctgtcagtc	tgccagcctg	ttctgtggat	ttccaactca	agattgcagc	300
atcaactcac	acctgaagtt	ctggcttccc	tacaaaactt	gaacttgcca	gtccccacaa	360
tggcataagc	caattcctta	aaatgaatgt	ctagttctag	ataatgtgtg	tattctactg	420
gttctgtttc	tctggagaag	cctactaata	gatcatttgt	cttagtcaat	tcaagctact	480
ggtacagatt	accatagact	gggtggttaa	aactaccaat	cttattactc	acagtttttg	540
gagtctggaa	agtctgagat	cagggttcca	gcaggattga	gttctttggg	gaacatnctc	600
tttctggntc	acagaatact	gggttacttt	aagtnggaaa	aagttagggg	aagctgggtc	660
ntttggcctc	ttcttttaag	ggggactaat	tcatgaaggg	ttccaccctt	attgacctat	720
tttaccttnc	caaangntt	ccattttccn				750

<210> 480

<211> 714

<212> DNA

<213> Homo sapiens

<400> 480

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gctaggcttg	ngaattcggc	acgagataac	acacatcaca	gtatgctctc	agaaatttct	120
ttatttgaac	cctataccaa	tatctgntga	tcaatgacca	tttttgctca	gcatggagaa	180
acagtgcctt	gcatgaagg	tagtgagaat	aaaaaggatc	ttaccacctt	tatcatgagg	240
gtggctttgc	tctctccatt	ccaagttggt	ctctgttcta	gaaagcagat	gtagtagaca	300
tctactgttt	ttgcctaaac	agaatccctt	tttctttttt	ttgttaaaag	tactcatccc	360
taatattaca	ttgttctgga	aggactgaaa	ataacagaac	tcagcaccat	gatcggaccg	420
ggacaatcag	attatttcat	tcctcancaa	acggagatcg	atccgaaaag	tggaaatatg	480
agctcttctt	tgggtgttgc	atatggaccc	tgagagaaag	aactttaatt	ttttctcttg	540
gactgcaata	aagtatagct	gcctaaaata	cgtttctctg	ccttggangt	ttgnccacaa	600
tcggtgaaat	aaangcaaga	cgtaacttgc	gatgaaaaaa	aaannnnnnn	naaaaaaac	660
tcgaccttta	nactatnnga	gtcgatacnt	aatcngactg	atagatcatt	gnta	714

<210> 481

<211> 742

<212> DNA

<213> Homo sapiens

<400> 481

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nactcgttct	ttctncacgc	acccatcgnn	ncgaattcgg	cacgaggcat	gaaaggagtc	120
ggaagcggaa	gcggtagccc	ggacggtgct	gtggtgcaag	ggcttgtgga	aaaattggag	180
aaaaccaagt	ccctggccca	gcagttgaca	agggaggcca	ctcaagcgga	aattgaagca	240
gataggtctt	atcagcacag	tctccgcctc	ctggattcag	tgtctcggct	tcagggagtc	300
agtgatcagt	cctttcaggt	ggaagaagca	aagaggatca	aacaaaaagc	ggattcactc	360
tcaagcctgg	taaccaggca	tatggatgag	ttcaagcgta	cacagaagaa	tctgggaaac	420
tggaagaag	aagcacagca	gctcttacag	aatggaaaaa	gtgggagaga	gaaatcagat	480
cagctgcttt	cccggtccaa	tcttgctaaa	agcagancac	aagaagcact	gagtatgggc	540
aatgccactt	tttatgaagt	tgagagcatc	cttaaaaacc	tcagagagtt	tgacctgag	600
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ttcagancca	atgacaagac	ccancaagca	naagagccct	ggggagccct	ctgctgatcc	720
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<210> 482

<211> 752

<212> DNA

<213> Homo sapiens

<400> 482

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cctccactgc	acctgctgcg	gagtggcacc	tttgcttgca	aggccctcta	ccccatggcc	180
cagtgtcatc	tcagcaggg	ctttggccac	tcaggaggcc	cttgtggtgg	gttgctcagt	240
ctgtccttcc	ctcatgagaa	gctactgctt	atgtccacag	accaggagga	gctgtcacgc	300
tggtaccaca	gtctgacttg	ggctatcagc	agccagaaaa	actagaggaa	tcttatagat	360
tccagaactc	aggatacctc	agggataggt	cacagccaag	agtacaaagg	aatcttcagt	420
actgaacaaa	acagaaccct	tcatgatttg	acaaaggtca	ctttctgttt	gcctggacca	480
agctactcca	gatcatctga	ccaactctta	aaaatcacgg	ccaggcacag	tggtcatgc	540
ctgtaatccc	agcactttgg	gaagcaaang	tggcaggatc	attccagccc	aggagtcca	600
agancagcct	ggcaacacag	tgagttagac	cctgtctcta	tttaagaaaa	aaattattaa	660

gaaattttat taaaaaagga agaatcagga aaccaaagtc aaccccaact taaccctcaa 720
tgaaccagcc ctaacacaga tgangggatt tg 752

<210> 483
<211> 849
<212> DNA
<213> Homo sapiens

<400> 483
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gtaacatcnng gaaaaaacag ctngngnctg ggngaaaaag gatgccaaaa tngcctggaa 180
aagagcagng gagaggagtc cgggagatgn gngatgcatc gggacgcanc atngntnaac 240
attcactggg tctgccaaaa atgtggattt gngggctgct tagatngtta caaggcaaaa 300
ggaaaggaaa gagttctaga gataaaagaa ctatatgctt ggatgaagtg tgtgaaggga 360
cagcctcatg atcaccaaca tttaatgccc aacccaaaat tataccnggt tctgntttga 420
cagacttcta gatgccatgc acactccttag ggaaaaaata ttgggattaa ancccatngg 480
cattggacta acaaacagga atttacaagg tnggaaantt ttncnaccaa tgaaaggggg 540
gatencaagg ttttccagaa nggntcntaa tcncaggnaa taaaaattnc tctngggcaa 600
gccctgagtc ttaancagca aaaanactcc tcccgaancc tgnagaaaaa agggggggca 660
gccaggcccn naaanggaan gtnaggcccn agatnaacaa ngtnacctcc ncccagnaaa 720
ccccannccc caactggnac cngggnaacc cacaacnttt gcngaagncc aaaaaagncc 780
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nggcccncc 849

<210> 484
<211> 1098
<212> DNA
<213> Homo sapiens

<400> 484
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cgggccncca ggnccgggna aaggccccc tttggcggcc cccggncggc cccaatgggt 180
tccaaaaagg gaaaaaaaaa aaagggggaa cctgggaagt tggcccanga aaangnaaaa 240
aaaggnaagn aaaccttcg ccaatgggaa tggggaaaaa taattttttc ttgaaaaacc 300
caaaaaagga atggttattt ttcaaattta aaaaaggaac nttgggaaga agaattggc 360
ttcccacnec cagaaagggc attactggct atgtcaagta aaagaagtcc ttcaaagctt 420
agttgatgat ggtatggttg actgtgagag gatcggaact tctaattatt attgggcttt 480
tccaagtaaa gctcttcag caagggaaac ataagttgga gggtctggaa tctcaagttg 540
tctgagggaa gtcaaaagca tgcaagccta cagaaaagca tttgagaaag ctaaaattgg 600
ccgatgttga aacggaagag cgaaccaagg ctntgcacaaa agagcttttc tttcactttc 660
gagaccaaag gggaaccagc tnnaagggcn agaaaagttn gaaaaaaatt ccaaaggaac 720
tgggtggaatc ccccaaaagg tttggttggg gaaagaaaaa tcccgcgcc aagccaaaa 780
tttaaaaggt ttngccccc aagggaaaag ncttgncett taaccagga attggggacc 840
ctgggantta aaaccnataa ttttccgcc naattnnaaa aaattcnttt nggggncccc 900
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<210> 485
 <211> 798
 <212> DNA
 <213> Homo sapiens

<400> 485
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 attnggcacg aggaaagggtg gcgcgcttct cacggctgag ttgctgcgcc ttgcagacgg 120
 aagctcccca caggcagagc tgcttgatg tgtgagtcac gaaccagaga agccccgctc 180
 catgagcagt gactcccan gccctgtgac ctccctcctn cttgcagctc ctccctggcac 240
 cagtcgccag ggctctcctg ttggtagtct ctgcttttct tcttggaat tccctgtgga 300
 cctcgagatc ttaccctaa aatagtctg ttgaatttca ccctggcaat gtaaattgat 360
 agcttatctt cacagatgcc agacaatgga caactcacca tcagtcctct gctcacctga 420
 gacaaatgca tgtctgattg ctccctctgc cctattgntt atgtgaaaat gcagattcac 480
 tgagccagac taaggcatca gtgactgttc ctctacctgc ctctcacatg gagattgtgt 540
 attcagtga aggctgatca aagacccaaa ggaatgcaac agtttatctc ttatctacct 600
 atgacctgcg aactggccaa caaccagtt gttgncgct tttcagacag aaccagtgtc 660
 atcttacag tattnaaatg gatgtcctgg ngctcnccta atatgtattc aaaagcaagc 720
 tggggcctng accaccctn ggcacatatt cctcanggac atcattcctg angctgtgtc 780
 actggcatgt ccttaanc 798

<210> 486
 <211> 785
 <212> DNA
 <213> Homo sapiens

<400> 486
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 tcgctgacaa cttgattggg ttctccttca ggtttgaagc gccctcgaga agtgtctaaa 120
 ggagacagtt gatagccaaa caacagtttt ggattcactg actgattatg aaagaagcag 180
 tagactggta tcaagaatca gtcagcaagg aggcctcac cagacgccag tgccatgttc 240
 ttggacttct cagcctccat attcatgaac taagtttttg gaatccttag gcttccacgt 300
 gtggaaagcc tgagctaacc tactggagga tgagccatca cctggagcag attcaggcca 360
 tcctagtga agcctcccta ggccaagcaa cctgccaact accagacatt gaccattcag 420
 ccttgaacat tcagcacaaa gacaaaacag accagaccag aagagtccca cagaataggg 480
 gaaactattc agagaaaact taagccacta agttttatgg tgttttgttc tgtagcagaa 540
 gcataggcat actgacaata caaaccgaaa tccttctaac gtagtggacc ttttcangcc 600
 agcatttttt ccttgaaaac ctggagcatg tatccatctt atagcagaga tcactttcac 660
 aatggttggg ctcttggtt tgaattgatg atgtaatgag ccctctttnc ngattgnaac 720
 ttaattactc tgggnatttg ntggattccc aaccttctaa tatttacttt tcctctttan 780
 taanc 785

<210> 487
 <211> 797
 <212> DNA
 <213> Homo sapiens

<400> 487
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 cgaattcggc acgagnnngg actaccttnc aaaaccnggt ngggaagcgt gttacagaan 120
 tgatntctan tccctgnat tctggatgct gcagaccaac acctgccnac aanacncana 180

cacacacann	caancantat	catgtaagac	agnncgntna	ntnnnnnatt	ntnatncttn	240
nncatttacn	cantnttgta	nantggntca	tgngtctata	natnnttgta	antattntnt	300
gananangac	ganantctga	atcttaagca	tatgctccat	cnttnnatat	gctntgggtg	360
agaggctngc	cntnattcat	nttnncatgg	agncaagttt	aatgcctcta	gantacattc	420
tgggcttcaa	gcatncttat	tttnnaactcc	ctgagtgatg	ggtggataaa	tcnaacattg	480
nctnagtggg	ntcaagacaa	ctttgntggg	ggttttgntc	acaatcatga	aaatggttnn	540
gccagataaa	tattttgata	ttagnnttcn	tttttnatat	anngcggtag	gtttgaattg	600
naenttnaaa	tgntnnggg	tgtnaagaca	ntggnttnca	atnnaattta	tnacatgaat	660
tggngnctcc	cctttggnga	aaccttaaa	aantntgna	tacttcttca	taaaaggggtg	720
tgngatttng	naantttcgg	gggttttnaa	ttttntntga	agcttatttc	ntganaatnt	780
acttggntta	ccaagcc					797

<210> 488

<211> 762

<212> DNA

<213> Homo sapiens

<400> 488

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ctcagggttaa	tgctgaaaaa	tcaccaaga	cagttattgc	aagagttaa	tttttgaaaa	120
ctggctactg	ctctgtgttt	acagacgtgt	gcagttgtag	gcatgtagct	acaggacatt	180
tntannggcc	caggatcgtt	ttttcccagg	gcaagcagaa	gagaaaatgt	tgtatatgtc	240
ttttaccogg	cacattcccc	ttgcctaaat	acaagggctg	gagtcctgcac	gggacctatt	300
agagtatttt	ccacaatgat	gatgatttca	gcagggatga	cgtcatcatc	acattcaggg	360
ctattttttc	cccacaaacc	caagggcagg	ggccactcct	agctaaatcc	ctccccgtga	420
ctgcaataga	accctctggg	gagctcagga	aggggtgtgc	tgagtcttat	aatataagct	480
gccatatatt	ttgtagacaa	gtatggctcc	tccgtatctc	cctcttccct	aggagaggag	540
tgtgaagcaa	ggagcttaga	taagacaccc	cctcaaaccc	attccctcct	caggagacct	600
acccttcaca	ggcacangtc	ccccaaatga	gaagtcgtnt	accctcatt	tcttnatctt	660
tttacttaaa	ctcaagaggc	agtgacagg	agtcaggggc	aagacattac	atttttcata	720
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<210> 489

<211> 822

<212> DNA

<213> Homo sapiens

<400> 489

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ttcgaattcg	gcacgaggat	tttcgaaact	cttcagctac	ttgccctttt	ttatctgaaa	120
ccatcatacc	ttctgaaaga	aaaaagcata	tcttcattga	cataacagaa	gtgagatggc	180
ccagtcttga	tacagatggg	accatcntnt	atatggagag	tggcattgtg	aagataacat	240
ctttagatgg	tcatgcatac	ctctgcctgc	ccagatctca	gcatgaattt	acagtacatt	300
ttttgtgtaa	agttagccag	aagtcagact	catctgcagt	gttgtcagaa	acaaataata	360
aagcccaaaa	agataaacta	gttgaaaaaa	ctggcaaaat	ctgtatacgt	ggaaatttac	420
cangacagag	actgaagaat	aaagaaaatg	agtttcattg	ccagatcatg	aaatccaaag	480
aaactttaaa	gaagatgagt	tgtgtaaatg	gaactgaagg	gaggaagag	ctgccttcgc	540
ctggtacaaa	gcacacatgt	gtatacacat	gggtcaagca	gtgctggtct	gtggctgcct	600
gtccagagga	atgggaaata	ttcctttgtc	tttagcactt	catttttcta	aataaaaaatc	660
anccaatatg	tctaaaaaaa	aantttnttn	ataataaacc	tngaagccct	nttanaacct	720
tntnttggag	gtcctnnttt	acnttatgat	tccgggaact	tggataagga	atcccntttg	780

gattgganat tttgggccna aaaccncna nnccttgaat cc 822

<210> 490
 <211> 789
 <212> DNA
 <213> Homo sapiens

<400> 490
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 aggtccaggn ccgctccttt cggngnggat tctcgcgga natccctccg gcagctcttt 240
 gcaaagctgn ttagaaactt ctcccaaact cggcntggat acgactgcta tagggctcgc 300
 tgctgctttt gtggagctct tgctcctcta tccttggcct ctcttgggat acggcccaag 360
 gccaaagtnt cagcgangtt ggtacgctta tttcgttctg gactctgggg gctntgaann 420
 ttcaccacgt ggactgctgg ggancgggnt nccgancact ngntacctt acnccanaat 480
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 ggggnntnncn gtgcaaatgg agncncaatt ggtgggcaaa tngttgatgg ncaaaacggg 600
 aaaaagcaac nnncaangct tttggtctnaa agccgatang acncaaatta nttctttgg 660
 accttganaa tttctcaan ntttttnagn annctttt ttncttggan aaanacttaa 720
 aagtgaacga ttnttgggaa anaaacaaac tataataact naaagctttt ntaaaaaaaa 780
 annaatnnt 789

<210> 491
 <211> 790
 <212> DNA
 <213> Homo sapiens

<400> 491
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 tngntngatc ccatcgattc gaattcggca cgaggnaaca aagaaggaa gtcttcctca 120
 tgtttnggtc tatagaagac gttaaagaaa acttcagaa agtgggttg aggcagtagc 180
 caccacgcct ggccaaagga tttaatgaat taatggatgt acagtgcctg ggctgttatt 240
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 cggtgagctg acatgggtcc actgcactcc ggcctgagtg acagagttag actctgtctc 360
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 acaaatgaaa aattgaaatt aatgtatata attagatatt attagctact cttaggttagc 480
 ttcatttgtt gaaagtgtga caagtgaatg aagttcacat ctggaaatcg ttgaacattt 540
 ttcgttcatg gaactcaatg gctacgttag tcgtttatgc ttttactgt tgggttaggg 600
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 caaaaattta ttttgatggg gctgaattgc tctgccaggg agcattttgg gtattgagat 720
 gaaaatggcc tctctttgag actgagctgc cacctggcaa attattgnet gcttaanggt 780
 tctctttatn 790

<210> 492
 <211> 804
 <212> DNA
 <213> Homo sapiens

<400> 492
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caacatggca	aagcaaatgg	taaaagcttc	cagactgttc	tactttgggt	ccgcgcgaag	180
cccactcacg	tgtgatctgt	gttgcccctg	ggaggcccgg	ggcgaccgga	aaagggctct	240
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ctgcagagaa	aatgtcccc	caccgccat	ctgcagccag	gtgtgtgcca	cacggcagcc	420
ttcccgaaac	atagtatgga	ttttaaaaat	gtgtttattt	ttgtttctca	accactttat	480
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atccttccca	ctgtttttat	cactgattta	ttttgtgaaa	agttgtacac	taatgttcta	600
tgtcaaaatc	aaaaagtatt	taatgaaata	ctagttctat	ttaatgtggg	ntatggaacc	660
ancttgaaa	cacaaaacaa	acaggggatt	gtacaagcan	gcttggggcc	caagnaagg	720
caaggttcat	ttggttacca	tatgccnata	aaacctcanc	gaanttttaa	aaaaaaaaann	780
nnnnnnaaaa	aancttgng	ggct				804

<210> 493

<211> 800

<212> DNA

<213> Homo sapiens

<400> 493

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aacttttgct	ttcaaagtgt	ggtgggacta	gaacacacaa	tggaaggatg	gagtcaggag	180
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ctacacagcg	ccttacagaa	caaacagtaa	aaaccaaag	gnaagcatgc	acnggcttaa	720
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<210> 494

<211> 757

<212> DNA

<213> Homo sapiens

<400> 494

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gtttgtatat	actgtattct	agccagaata	atttttagatc	tgatcaggta	gtagctaaaa	180
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aaagcagatt	gtcttcctgt	ctccgctgct	cccacagtag	gtattgaaac	tggtaaaatc	420
agttttttga	tagtgtgtgt	atataagaaa	aaatagatac	acacattctt	ttttctcagt	480
caacacattg	attgaacact	ctggcaaaga	tgctgtgggtg	gatgangttg	gagttcgaaa	540
agaagaagca	agcgtggcc	tgcttgaaa	gaaccgaaa	gtctttccca	ttcacttctc	600

tagaaagctg	ccaagacaga	ngcagaaagg	aaatggatga	tagttctgtc	aagcacactt	660
ctgntctcnt	agaacttaga	aatggttcta	agagaacaga	agttatngag	aacagttcnt	720
gtggaattca	acatcttggg	tgggacncat	tggcctt			757

<210> 495

<211> 756

<212> DNA

<213> Homo sapiens

<400> 495

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aatacgtgta	cacttgactg	tgaagtggct	gtgagagtgg	gtggagagtt	cttctttgac	180
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cctctgcttt	ccatcctgcg	gcacgcagca	gatctcctca	gagagcaggc	aaacaaaaga	300
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ggaagaataa	cggagaagga	gataagagat	catatttcaa	aagagacttt	gttctatatt	540
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agaacacatt	tgctttgaga	agtggtggtg	ggaggcagac	aaaggcagaa	aaaattaaga	660
ggtgagatct	actcaggaga	gctcaaaann	aaaaaaaaaa	aaactnngac	ctntagaact	720
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<210> 496

<211> 744

<212> DNA

<213> Homo sapiens

<400> 496

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tgatcaatga	ccatttttgc	tcagcatgga	gaaacagtgc	cctgcatgaa	gggtagttag	180
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gttctctgtt	ctagaaagca	gatgtagtag	acatctactg	tttttgccta	aacagaatcc	300
ctttttcctt	tttttggtta	aagtactcat	ccctaataat	acattgttct	ggaaggactg	360
aaaataacag	aactcagcac	catgatcgga	ccgggacaat	cagattatct	cattcctcag	420
caaacggaga	tcgatccgaa	aagtggaaat	atgagctctt	ctttggtgtt	ggcatatgga	480
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actggatgaa	aaaaaaaaan	nnnnnnnaaaa	aaactcgagc	ctntagaact	atgtgatcga	660
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<210> 497

<211> 772

<212> DNA

<213> Homo sapiens

<400> 497

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gagcacagat	catgccactg	cactccagcc	tgggcaacaa	aacgagactt	cgtctcaaaa	180
aaaaaaaaa	tagaatttgg	atcctttggt	egggtttctc	caaattcttt	tgagggtgtcc	240
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gttaagtata	catttatttt	ttactgtgac	ttgttcagga	ccacatttta	caaaatgcct	420
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gaaaaatttc	ggaatattca	cattcgaaga	tccttattat	gaatgtcttt	gacttaaatc	660
taacacaaaa	ctgcacatta	ttctttgnac	attttcatta	tatagngtta	acaagcttan	720
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<210> 498

<211> 773

<212> DNA

<213> Homo sapiens

<400> 498

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tcacctctct	gtgagctctc	tgtaatgtctc	tntcttgccc	atcaccacat	ccctagtact	180
gggtatcagt	ctggccactt	ggctttcttg	tttgcccaa	tgtggtctat	tcttgatgca	240
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gtaactgcc	atctcactta	gaataaaatc	cggactcctg	tgaagcacag	nataaaactgg	360
cactgcctat	gcagcaacct	catctttacc	gtttctgcct	tgctcactcc	cttcagcgcc	420
ggtattcttc	ctgatgcccc	tagtacacaa	caactccttc	ctgctccaag	agtaggaaaa	480
tnactgtctc	tctgccagt	agattcctct	tctggatta	cctntgcttc	attgctgaat	540
cttctgcaat	atcatcttct	aaaaagagcc	tttnaaaatc	accttttcta	ttatgcccta	600
ctcantttcc	agtccttgaa	tggccattcc	ccactttcat	agccacttaa	ttgctatctg	660
aaattacact	taaaatgggc	accttcatga	tgggaaggca	attaattgcc	tttgctactg	720
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<210> 499

<211> 735

<212> DNA

<213> Homo sapiens

<400> 499

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catgctgtgc	agactgttga	aactntgaat	gaagggggacc	atagagtga	ggataagctg	360
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aaagaacagc	ctanagnaaa	tggctngaga	ngaaccacat	tcccatcact	gaacagggan	480
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naaattncac	cagctctnat	gagantattn	tgctcgctgt	tcaggatctt	antgaaggac	600
atcttacant	ttnccaanna	naagnatga	aatgtgacat	tctgcttgaa	naagacnata	660
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tngtgagttt anang

735

<210> 500
 <211> 926
 <212> DNA
 <213> Homo sapiens

<400> 500
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 tgtaacacag aatactgtca atccctaatt tacttaatgt tacttattgg aagtggggct 180
 gatgaaatac gcacaggagg gaaatctact gtgttttaggc acaggcagnc ccagtgtata 240
 aggagatcat attccaaang gttgtcagtt ggntgtttgc aacctggaat gtattttcct 300
 ttagagacca ngttatccat ggtggtagg cccctagagc agctggaaaa agatgatcaa 360
 accaataggt tngctgacat cnaataatgt aataagtttg cttaaaggaat ctaccatcaa 420
 atntnatatt gnttcaggg aaggttgnn nttaanntnc cntcttngtg ncatantgga 480
 cnntccentn ccagtcant ntntnannnc tngggcnngt ntngnnttng tntnttngn 540
 cncntnanc atatttcata tncctctng ctaaaattct ttnanannaa nttctcantt 600
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 tcnnanant cattnnntnn tntnngctn nttnatcacc ctanctcnn tctcanntat 720
 cntntctnta ttatctctnt attntctnt tntnatatc ntccnnntt gtntannca 780
 ttatntcttg tntntntnt cncatctctn tcntnttctc ngctnannnn actccnnnn 840
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 cnnnatnca tnnnataatn ntngt 926

<210> 501
 <211> 706
 <212> DNA
 <213> Homo sapiens

<400> 501
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 cagacttgga aacatgcttc aattctaatt cagcaacatt atcgaacata tagagctgca 180
 aaattgcaaa gagaaaatta tatcagacaa tggcattctg ctgtggttat tcaggctgca 240
 tataaaggaa tgaaagcaag acaactttta agggaaaaac acaaagcttc tattgtaata 300
 caaggcacct acagaatgta taggcagtat tgtttctacc aaaagcttca gtgggctaca 360
 aaaatcatac aagaaaaata tagagcaaat aaaaagaaac agaaagtatt tcaacacaat 420
 gaacttaaga aagagacttg tgttcaggca ggttttcagg acatgaacat aaaaaaacag 480
 attcaggaac agcaccaggc tgccattatt attcagaagc attgtaaagc ctttaaaata 540
 aggaagcatt atctccacat tagagcacag tagtttctat tcaaagaaga tacagaaaac 600
 taactgcagt gcgtcccaag cagttatttg tatcagctt attacagagc ttttaagtcca 660
 aagatatcaa atatgcacgg gctgcacact aatcagctt ctatca 706

<210> 502
 <211> 784
 <212> DNA
 <213> Homo sapiens

<400> 502
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caccataaaa	cacacaggtg	actttgcctt	gaatctgcag	gactgaagcc	aactcttggg	240
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tgggatgtga	caccgagata	aatcagagaa	aagctgtgaa	gcttggggaa	cagagggact	360
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gnngaggccn	tattttacgtt	anattccaga	cnttgaatan	ggatnccatt	tnnattgaaa	720
ntttngggcc	aaacccccaa	ccttngaatt	gccattngaa	aaaaaaatgc	cttttatttt	780
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<210> 503

<211> 764

<212> DNA

<213> Homo sapiens

<400> 503

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tctaaaaagc	tgccggttat	ttaaccccaa	tgatgatgga	aaggaggaac	caccaaccac	180
attacttttg	gtccagtact	acttggcaca	acattatgac	aaaatttggtc	agccatctat	240
tgctttggag	tacataaata	ctgctattga	aagtacacct	acattaatag	aactctttct	300
cgtgaaagct	aaaatctata	agcatgctgg	aaatattaaa	gaagctgcaa	ggtggatgga	360
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gagagacttt	tataggaaat	cactgatgac	ccagtttgac	tttcatacat	actgtatgan	660
ggaanattac	ccttagnatc	ttatgggtgg	actttattta	aaaacttnca	nnaatgttcn	720
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<210> 504

<211> 795

<212> DNA

<213> Homo sapiens

<400> 504

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cctcagatgt	tgcccttcaa	ccccaggaaa	agaactatg	atcgagtaat	gaaagcactg	180
gatagcataa	cttctatcag	agaaatgaca	caagcaccat	atctggaaat	caagaagcaa	240
atggataaac	aggaccccct	tgctcatccc	ttactgcaat	gggttatatc	aagtaataga	300
tcacatattg	tgaactgcc	agttaacagg	caattgaagt	ttatgcatac	tccacatcag	360
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gaatctatct	tagtccaatg	tcaagcntat	cattttgntt	actcagggat	gaaccangaa	600
acagaaaggt	ntcagcccag	gacgagccac	cttcaagcng	ttaanaagcc	agcaattaca	660

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ttcacagtcn ccaggaaana aaaggncagn cctatccccc ctttncttgg caaaaggccc 720
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cttggacccc tgnctn 795

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<210> 505
<211> 774
<212> DNA
<213> Homo sapiens

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agaacttgaa ttgggccttg gaagaagaac agccattcaa atagatagaa ttgtggtagc 180
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gactgggtact ttagggaattt taaaatgtgg atcattgtac tactaataac tattttattt 420
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ccaaagatna tataaaaata atggatctct ccttttcctt tatgcataaa atatggggag 660
cntttttaa tcattaccca tncgattgnc caaaaaaata cctttnngga aaactgatta 720
ttantattcc anaataaatt tcaacggcct gcntngnctn ctttacaact ttnt 774

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<210> 506
<211> 796
<212> DNA
<213> Homo sapiens

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cgnnngntcaa ctcgggatnc ntcgncttaa naaaatnttn tccnggancc cntcatnan 720
gaanaacacc anactattnn gggnacctgn aangetcaat ngcccnngcc ncnnangnctn 780
nttttccngg naannn 796

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<210> 507
<211> 774
<212> DNA
<213> Homo sapiens

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<400> 507

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aatcaacag tattttcaac aagaaatgtg caattgaaat caagtgtgt ttaagtgcag      180
ctaggatttc cacaggaaga cacttgcagt gaacagagtt atggagcagc aaaaacacag      240
atctatttgg aaaaagagaa aacatatgcy ttgtattttg cttcaattat aaaataccat      300
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ttgagcctca tccttaaagg attttcggga aaacattaag gggagccaaa nccnattggn      720
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<210> 508

<211> 724

<212> DNA

<213> Homo sapiens

<400> 508

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actcccttcc ctgcctccaa gacctggtgt cccccactgt gagccagct gtccacagg      180
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<210> 509

<211> 803

<212> DNA

<213> Homo sapiens

<400> 509

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aagaaagaca ggaatttgag aaagaacgga gagaaagaga gagggagcgt gaaagggaac      180
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tcgggatcga gagagagatc gtgaccggga tagagaaagg agctcagatc gtaataagga      360
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gagagagaga gaaccgagag cgagaacgag aacgggagcc gagagagaga gcgagagagg      480
gaaccgggag cgagaaagag aaaaagacaa aaaacgggac ccgagaagaa gatgaagaag      540
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attacgtaga tccagacatg ataagataca ttgntgagtt tggacaaccc ccacttgaat      660

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gcagtgaaaa	aaatgctttt	tttgtgaaat	tttngatgc	tnttgctttt	tttghtaacca	720
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<210> 510

<211> 789

<212> DNA

<213> Homo sapiens

<400> 510

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gaggagagact	ggggagaagg	gaaaagagag	aaggcaggga	gagtagggag	agaaaacctt	180
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<210> 511

<211> 776

<212> DNA

<213> Homo sapiens

<400> 511

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gantcctcac	aaacgggtta	gccacccgc	tcaggctgtt	ctcctgatat	tgagtctcca	480
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<210> 512

<211> 917

<212> DNA

<213> Homo sapiens

<400> 512

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tccttaccct	ggtccgggtg	gaggagggtg	gggtagcgga	agcagcttcc	ggggaacccc	180
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nccncanggt	tntncaagga	catntacacc	atttgatca	nggcgtntta	naaaaaaaaa	480
aatgttaatg	anttggaaaa	ntatttnaaa	gcctttnaat	gnttnnnnna	atccttnggg	540
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nnnttaaaaa	ntttnnnccc	ccaannnnnt	nnanngnanc	ttttnnantt	ngggantaaa	840
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<210> 513

<211> 780

<212> DNA

<213> Homo sapiens

<400> 513

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caccagaagg	accttgaaca	cngaggatgg	ggatggactg	atgatttttg	acaacaaaaga	720
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<210> 514

<211> 793

<212> DNA

<213> Homo sapiens

<400> 514

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tgtatactat	gaacaatttg	taaatgtctt	aatttgatgt	aaataactct	gaaacaagag	360
aaaaggtttt	taacttanag	tagccctaaa	atatggatgt	gcttatataa	tcgcttagtt	420
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tttgggggta	caacttcatt	ctatagaata	ttaaagtggga	agtgggtgaa	ttctactttt	720
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<210> 515

<211> 770

<212> DNA

<213> Homo sapiens

<400> 515

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<210> 516

<211> 825

<212> DNA

<213> Homo sapiens

<400> 516

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gcntgctnan	tgctntgtag	nnccctttctg	nacnntaggc	attgctcttg	gagaacnnga	180
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acantttctg	aaatacacnt	ttagtgatg	gaantacaag	accnntaaag	gnctgccagg	360
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tcttgatggg	gtctttttcaa	tcantgtatc	tgctgaaann	tcttaganaa	anctatgtgn	480
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nccnannntg	gacntttgct	ttttggnncc	nnaccccccc	aaagggngcn	cacctccant	780
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<210> 517

<211> 1444

<212> DNA

<213> Homo sapiens

<400> 517

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ccnctattnt	cntnntntc	nnntcnnnn	antnctnnnt	tctnccnnn	canctntcca	180
tnntntactn	tcnntntct	ggctntnta	tntggggggt	ctattntntn	ncctaaatcg	240
actngttcca	agtctctan	cngctctnt	ctnnctntct	ntgcctnctn	ctggggcctt	300
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aacaggnacc	ncctntntc	tcnaaatcct	catnctncta	ctttatatnt	cnccaagcct	1380
cncctntgta	anagcatctc	nctntcncnc	aatnnaatc	tcctnctctc	natanatntn	1440
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<210> 518

<211> 706

<212> DNA

<213> Homo sapiens

<400> 518

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caagtttgcc	ttctcctatg	ttttccagaa	atgacttcag	tatctggagc	atcctcagaa	180
aatgtattgg	aatggaacta	tccaagatca	cgatgccagt	tatatttaat	gagcctctga	240
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agctccttga	acacaatgag	gcatacatat	ggacaaatcc	cacctgctgt	gtgcataata	660
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<210> 519

<211> 734

<212> DNA

<213> Homo sapiens

<400> 519

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agagaacaga	gctggatgac	tatggccaat	ttggagaaag	agctccagga	gatggaggca	300
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agaaatgnga	aagatgcacc	aaaaacaana	agctttctac	acantnaaat	ccnannaact	660
ccatccntct	anaactatnn	gtgagtcctt	nttaentcna	tccagacatg	antancnata	720
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<210> 520

<211> 701

<212> DNA

<213> Homo sapiens

<400> 520

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cacttttagat	gaagagttac	ccaagagagt	gaaagctcga	ttttccacag	cctctgacat	180
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gtgaaaggaa	atactagtga	atcacccaca	aggaaaagcc	actgccacag	aggaggcggg	660
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<210> 521

<211> 784

<212> DNA

<213> Homo sapiens

<400> 521

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<210> 522

<211> 719

<212> DNA

<213> Homo sapiens

<400> 522

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gatatgagga	aattgttaag	gaagtcagca	cttacattaa	gaaaattggc	tacaaccccc	660
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<210> 523

<211> 710

<212> DNA

<213> Homo sapiens

<400> 523

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<210> 524

<211> 730

<212> DNA

<213> Homo sapiens

<400> 524

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<210> 525

<211> 711

<212> DNA

<213> Homo sapiens

<400> 525

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<210> 526

<211> 692

<212> DNA

<213> Homo sapiens

<400> 526

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gaactgtccc	ccgcagctct	gtctcccttg	ctagagccca	tcagatgctc	tcaccagccc	480
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gtactttgat	atgtcacagt	ttcatgttta	tccagttcaa	tgtattttta	aatttttccct	600
tgagacttct	ttgactgata	gattattgtg	aatgtgtttt	taaattttcca	aatgtttang	660
gattttcata	tctttcttat	gctgatttcc	aa			692

<210> 527
 <211> 769
 <212> DNA
 <213> Homo sapiens

<400> 527
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 ttcagtctgg aacaaaaaca gaacccttct atgattgaca aangtcactt tctgtttgcc 420
 tggaccaagc tactncagat catctgacca actcttaaaa atcacggcca ggcacagtgg 480
 ctcatgcctg taatcccagc actttgggaa gcaaaagtgg caggatcatt ncagcccaag 540
 agttcaagac cagcctgggc aacacagtga gtgagaccct gctctattta agaaaaatna 600
 ttaagaaatt tattaataaa gaagaatcag gaaaccaagt ncaacccaac ttaacctcaa 660
 tgaaccagcc cctaacacag atgangggat ttgggactga taagctctgt gctgngtcca 720
 tggcccgta nttatcaagg ttgcactttt aaatgnggta tttttatgn 769

<210> 528
 <211> 757
 <212> DNA
 <213> Homo sapiens

<400> 528
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 ngngattctg acagtggagt tgacananag ntaancagga aaaacaagtn gctccagaaa 180
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 gcnattttta aggcaaagtg ctaattgata ttanagaata ttgnatggat cctgaaggtg 360
 aaatgaaacc aggaagaaaa ggtatttctt taaatccana acantggagc cagctgaang 420
 aacagattct gacattgatg atgcagtaag aaactgtgaa attcgagcca tataaataaa 480
 acctgtactg tctagtgtnt ntaatctgtc tttttacatt ggcttttgtt nncetnaatgt 540
 tctccangct attgtatgtt tggattgcag angaatttgn angatgaata cttnttttta 600
 atgngcatta ttaaaaatat tgagtgaagc tnatngtcaa ctttattaag gattactttg 660
 ctgccaccac ctagtgtcaa ataaaatcaa gtaatacaat ctttaataaac ntttaaacta 720
 taaaaactcg acccttagac ctatantnag tcggttn 757

<210> 529
 <211> 821
 <212> DNA
 <213> Homo sapiens

<400> 529
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 gaaagcaaag acgcaaacag atgcctgtgc accaaagtgc acgggcaagc atccttcggc 180
 cttaatgggc agcattccgt cgtcacaagc gggcattcat cctttcatca atagcgggca 240
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ttggnccgtt ggtgatgttt gcatacctct gaatatgctt aaganccaca gaattgacca 780
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<210> 530

<211> 765

<212> DNA

<213> Homo sapiens

<400> 530

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tgggcccggg cacgaacaaa acgggcctgg acgcctcgcc cttgcccgca gatacctcct 180
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cccgttaact ctggcaccac ggatcgagga caagtgagag agcaagtggg ggtcgagact 300
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acagataccc caggtcttat ataaggagga aaacgggaaa gaataataag ttaaaaaaaa 480
gcctccgggt tccactactg tgtagactcc tgcttcttca agcacctgca gattctgatt 540
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aaattttgtg agtgactcgg tgtaaaacca tgtagttaa cagaaccaga nggttgacta 660
ttgttaaaaa caggaaaaaa ataatgtaag gtctgtgtga aatgaccaan aaaaaaaaaa 720
aaactcngcc tntaaactnt tntgagtctg ntctgtaaat ccaan 765

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<210> 531

<211> 768

<212> DNA

<213> Homo sapiens

<400> 531

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tcagaacaaa ttgccaaaag ccagagtgtt ttatgctagt gcaactgggt gcttctgaac 180
cacgcaacat ggcctatatg aaccgcttgg catatggggg gaggggtact ccatttagag 240
aattcaagtg attttattca agcagtagaa cggagaggag ttggtgccat ggaaatagtt 300
gctatggata tgaagcttag aggaatgtac attgctcgac aactgagctt tactggagtg 360
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gtcaagctgt nggtcattgn cagagagccg gntcagcaag ctgcagatct gattgatgct 480
gancaacgaa tgaagaagtn catgtggggg cagttctggc tgtcaccaga ggttcttcaa 540
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aatggaaaat gtgtngtaat tggctgcagt ctccaggagaa gctnnaacat tagaactttt 660
gaagaaggcn ggggagaatt gatganttgg ttcaactgcc aaagtgtgtg cantcactca 720
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<210> 532

<211> 761
 <212> DNA
 <213> Homo sapiens

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 tgagccacct tgcccaccca catcatacag ttgaaatgaa actttgccac aaccagcctt 180
 tgctgtacac acacatatat cactgaacct ggttgaaata aagntttttt tctttttcct 240
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 agagtgttgc tctggtattc tgagagttgc tctgtattct gggttctgaa gattatttga 360
 aaaataactc ctactacatt gaaatgcaga cttaaaaatt taaacattgg attaggcagt 420
 caaaaaaacc aagcaagcat aaaaggtcaa taagttgtaa tcttgatagt aaaggtggaa 480
 aacttattat aaatggaaag aaagtattt tcttttttg gttgatgggc agtatgccat 540
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 ttgagggag taccaaggca gcttttttcc tcaaaagtac ctggtcctct ttgggaatag 660
 cacattttan gggcattggg taatcctgag attttactca ntaaatcctg atgggtactgg 720
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<210> 533
 <211> 735
 <212> DNA
 <213> Homo sapiens

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 ctccagttcc tgggttcaag ccataccctcc tgctcagcc tccccagtag ctggaactac 180
 aggtgtgtgc catcacacct ggctttacat tttctgtgg ggtcttacta tgttgccag 240
 gccggtctca aactcctgag ctcaagtgat cctctgcctc agcctccaga gtatctggga 300
 ttacatatgt cggctaccgt gtctggccgt tcacatcttt ggccactatt tgcttgtgaa 360
 aaggtataat gaggtggtac ttatcatttt tactgngtct catgttttgt atatttttgt 420
 ttcatcaact aagatgcact gtaacatctc tgaaatctgg atatattatc aatggtttat 480
 catagttttg ttagcaatac actgtctttt agtgggtgct aaaataatgg tatagttgtg 540
 aggtgatctt agatttgatg aagcacagta tgagggtagg cctaattggg gaagatggta 600
 atataaaaagc aagaagtatt ttttttttgt aatgactgaa agctgtctgt ggatgacct 660
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 aaaaataact tgagc 735

<210> 534
 <211> 735
 <212> DNA
 <213> Homo sapiens

<400> 534
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 agataatgtc ttttaataat ggtgctggga aaactggntn tccantntgc agaagaatga 180
 aactagaccc ccatctctta gcatatacaa aaatcaaaat taattaaaaa gttaaattcta 240
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 gtgggcaag atttcttgtg taatacctga caaacaggca accaaagcaa aagtgggaca 360

atgggatcac	atcaagttaa	aaatcttctg	cattgcaaag	gaaataacaa	agtgaagaga	420
cacccataga	atgtgagata	atatttgcaa	actatccatc	tgtattaggc	catttttgaa	480
gtctacaaag	aaatacttga	gactgagtaa	tttataaaga	agaggtttaa	ttggctcacg	540
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ggaaagttcc	acccatgggtg	gangcaaaag	gggaataagt	ttctccatgg	cagggtgcagg	660
gcaaaaanan	gggggaagg	aagtgcenca	caaccagatc	ttgtgagtn	tcagatttgn	720
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<210> 535

<211> 735

<212> DNA

<213> Homo sapiens

<400> 535

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aaggcaacag	aaacaaggag	agaagcccga	gagacatgtc	tgcgtgctgc	cacgcactctg	660
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<210> 536

<211> 785

<212> DNA

<213> Homo sapiens

<400> 536

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gtntgcctgc	accacccctc	gccttccttc	atacctttcc	ntggatatgn	atgccagggc	420
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antnttctna	gtgtnacntn	agttcaatgc	ctggccatnt	gcnatnacct	tatatcntnc	600
aaagaggcta	ctgtgctttt	ancctttttt	aaaacctcca	tctgtattac	attgnnaacc	660
angtttcttt	aatnaggagc	ttgacctcta	nantgggaac	tcttgggaat	ggnccttagtg	720
aagttcgcn	ctaacttaac	ctgaaaatta	tnatgnnctg	tttnacctat	catgttnata	780
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<210> 537

<211> 967

<212> DNA

<213> Homo sapiens

<400> 537

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atntctttac ccccnannnn ncacanatgc agacncacac atngcanncg nacacncaga      180
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gntaacanan gnacnatggn accnatccct ntngaagna aggaactncc tgnncgacta      840
nnnactatgn naaatattct cacatntaca naaaaagnag gnnccnnggt ncttnaagnt      900
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<210> 538

<211> 892

<212> DNA

<213> Homo sapiens

<400> 538

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acatctactg tttttgcta aacagaatcc cttnttcctt tttttgttaa aaggetcatn      180
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anctentcta tcctantat nantnattct taccatnaaa tacactanaa gtnntntcac      780
gagacncgnt atgttantnc anactataat cgcttncatn tanntatatn taaaantgct      840
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<210> 539

<211> 751

<212> DNA

<213> Homo sapiens

<400> 539

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taaatgtcaa	agtcttcctg	ttaaaaaaaaa	aaaaaaaaaa	actcgancct	ntanactata	660
gtgagtcct	attacgtaga	tccagacatg	atnagatcat	tgatgaattt	ggaccaaccc	720
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<210> 540

<211> 761

<212> DNA

<213> Homo sapiens

<400> 540

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gtgatcattg	ttaattagtg	acatagtaac	atctgtagca	gctgggttagt	aaacctcatg	180
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gcctccaaaa	gtgttananc	caatcatttn	aaataaacn	ggntgtatat	tgcattnatgt	720
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<210> 541

<211> 748

<212> DNA

<213> Homo sapiens

<400> 541

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gccacctgga	ggggcattgc	ttggttcgcg	tgggtancaga	ggagcttgag	aatgttcgca	180
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748

<210> 542

<211> 784

<212> DNA

<213> Homo sapiens

<400> 542

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gacanantgt	tntgantgcg	gattaganac	cacngaagnn	acactnaagg	ancancatct	300
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gctggcagct	taanagcgtg	ttangactct	gcacgaagan	gacaggtntt	ntgagagcct	420
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gcccancctt	aangaagcna	ctttttaatc	cancggaacc	ngcttgagan	aaaaccnttt	660
ttgacccaaa	accnggagaa	ccagctggcc	taccaaaggg	aaatgggccc	ccatttgaa	720
ttgggggtnc	ccangaacaa	nccttgnccg	ggncaaagcc	cnttgttgga	aaggacctca	780
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<210> 543

<211> 764

<212> DNA

<213> Homo sapiens

<400> 543

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cctgaatgac	cttgaaaata	tnattccatt	nccttgnatt	ggcatnctgt	attccttgag	420
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gtaggatatg	gannactctt	tccatggctt	acacgntgcn	gtaaagtaaa	ttggccctgt	600
gcagaaaaac	attccactca	gtnttccaan	tggcttntta	aggaattctn	gaccttgcaa	660
ttnatantgg	agnnctttcc	ttaagattta	aaggtttgan	ggngagccnn	aggaattntn	720
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<210> 544

<211> 755

<212> DNA

<213> Homo sapiens

<400> 544

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ggaaacattt	tttatgtttt	agtaaacagt	atttttttgn	tgtttcaaac	tgaagtttac	360
tgagagatcc	atcaaattga	acaatctggt	gtaatttaaa	attttggcca	cttttttcag	420
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tgaaggtgaa	cattcttgat	ttttgctgat	gtgaaaaagc	cttgggtattt	tacattttga	540
aaattcaaag	aagcttaata	taaaagggtg	cattctctca	ggaaaaagcc	atcttcttgn	600
atatgtenta	aatgtatttt	tgncctcata	taccggaaag	ttcttaattg	gattttacca	660
gctgnaatgc	tttganggtt	ttaaaaaata	taacattttt	aataattttt	taaaaggaca	720
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<210> 545

<211> 767

<212> DNA

<213> Homo sapiens

<400> 545

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cccngtgnt	gtacaaaagc	ttncnacatt	tanctggctg	aggagtnnct	caccntaac	540
ttccancnan	tcnnttaagc	nnanncatnt	tgaacacntg	agcccannta	nggtcgtatg	600
tnntagtnaa	ccgtgactgg	accacttaca	gtccaagccc	gggtngcctt	ataaaagaan	660
cggaaaacat	ttcnttaatt	cgggttnnag	cnttanctat	ttcggaatnc	cttgngtttt	720
naaaaacttg	aatctccaan	aaacagggtt	ttttcttttg	gnccann		767

<210> 546

<211> 989

<212> DNA

<213> Homo sapiens

<400> 546

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nttnncnccc	ttatngnaca	cacattgncc	tgattggncn	tnccnngct	agcttncagt	360
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tnnctnnccc	nnatancacc	ccnctcnctt	tcctttctaa	acttnacacn	ntccctgana	480
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ntccngctc	ncctcattt	tnctacgtnc	cnccttctnn	ttactgnct	ttaaanttta	600
ttancnnent	ntnctntn	atctncaant	ttctnnnccn	acnnnnnttt	ncnntnnca	660
aatcgcgna	aataagtntt	gcncactcnn	ntnctanent	attntccctc	genntntcn	720
tcactctccg	cnncactcac	ntnnncnnnt	caattntnn	nnaencncnc	tgctctacnn	780

nccatntctn	tnccctncaca	ccctntanch	ntnctctcan	aatgcctttt	ctnccttann	840
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<210> 547

<211> 781

<212> DNA

<213> Homo sapiens

<400> 547

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cggggggcac	gtggagtcac	tgggaacattt	gngcaatgct	ggtgggaatg	tcaacccgng	180
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tcacattac	ggcancatcc	gtcgtaacag	cggtacatc	acttcgccac	agnggcagca	420
tctgtngtca	cagnggcngc	anccttngcc	aaagcggcag	cntccttctg	catagcggna	480
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ccgaatgggc	acttcaaag	ggaanaaggg	ngatggcact	nccggtnncc	tnganagggg	780
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<210> 548

<211> 735

<212> DNA

<213> Homo sapiens

<400> 548

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gaaatggttg	ttcatgtcat	ttgctcattt	ttatattaga	ttgtttttct	ttttccagc	360
tgacttgtag	gaactctaca	tcttatcaat	attaatcatt	tatcgaaaac	tatttggtg	420
ccattatctt	ctcctagtca	atgttttttg	tttgtgatat	cttttataat	atataagttt	480
ttaatgttgg	cagaagtaaa	gttaatcttt	ttggctgtgt	tgtgtgtctt	gtttgatgta	540
aagatagttt	ctgtaatagt	tttgagttt	gattgntcat	cttttaggtct	tcaattcaac	600
ctgcacatcc	atccctctca	tcctctttct	tactctgttt	ttctccatac	caettatcat	660
ccaataatat	ggtcatgcc	tttattnacc	ngntttgcat	atataatttg	gcttgtnccc	720
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<210> 549

<211> 812

<212> DNA

<213> Homo sapiens

<400> 549

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ccttccatgg	nctctgatgt	gggacacttg	aacgangcac	gattctgaag	gactccatgg	480
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gggaaaaaat	gccttncatt	gggnaaaacc	ctggatccct	tgtaancct	ttgggagntt	780
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<210> 550

<211> 742

<212> DNA

<213> Homo sapiens

<400> 550

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gtntctcgca	tggaaaggggt	cctcagagta	ctgggtatatt	tncttatccc	ttgactctga	420
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catgccatnt	ggcgccttgc	tggctttcca	tganccctt	tggcaatcat	gggtcttntg	720
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<210> 551

<211> 736

<212> DNA

<213> Homo sapiens

<400> 551

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ngngtggcaa	agtccaagtt	gttacctgn	gctttaaaaa	aaatcttate	tgcatgtatt	300
gttaacttag	agaccatgag	atctatttat	caggaccagg	aagatncaca	cttcagggtcc	360
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tccacaattc	tgtggctttg	atattagccc	caattttaca	agcacatata	agccccataa	480
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catccttact	aggcaaaatg	tattatgatg	caataagtg	cactgggnat	tttnacgttg	600
ggactggnca	ggaactgctg	caaagaaaaa	taacagctcc	ttctccatta	tttacattta	660
agatgttggt	ggggggaagg	ttgggagaaa	ttagttctga	gggtatcata	tgcctttttt	720
aaagaaaatg	ggaata					736

<210> 552

<211> 733

<212> DNA

<213> Homo sapiens

<400> 552

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atgtcaaagt	tctcctgtta	aaaaaaaaaa	aaaaaaaaac	tcgagccttt	anaactntnt	660
gagtcgtnta	cntagatccn	gacatgataa	gatcatgatg	agtttggaca	accncactng	720
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<210> 553

<211> 870

<212> DNA

<213> Homo sapiens

<400> 553

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<210> 554

<211> 766

<212> DNA

<213> Homo sapiens

<400> 554

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tccgggaaaa	gggaanagcc	tccttggttt	acanattggg	aaaaattggc	cccaangggg	660
gttaaccang	tttgcccntt	aataactnaa	anggatTTTT	gncaaaacct	ggttccaagg	720
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<210> 555

<211> 770

<212> DNA

<213> Homo sapiens

<400> 555

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cogggaggtg	attgggtcat	gggggcttga	accctccgga	atagattacn	gctgcctcct	540
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aaagcaagac	tnactcctta	tgcaccgttt	ntttgcatat	gcccctctgg	gggnancttc	660
tttggtgct	aacatttttg	gacccaacct	aatgggcctt	nacccagaaa	nccggaacaa	720
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<210> 556

<211> 756

<212> DNA

<213> Homo sapiens

<400> 556

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ctggancttg	aaagtcctcc	ttntaccaac	tccacntcca	ccccntnatt	ccntntntcc	180
caaagtntcta	ctgntgttgc	ntgacanccc	caaantgtgn	ctgtcaacac	aaacctgcct	240
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ttcactagtt	cttcattaat	aaatatcatc	ttccccattc	tgctgctgaa	tgccacacat	360
ccatccagtc	tgagaaagt	agagaggcaa	tcatgccaa	gaaagccag	caaagctctt	420
tcaccagatg	tagactgtag	ccctgtgcc	ttccctccag	cgagtctgcc	agcatgcttc	480
ttcatccttt	taatatgtcc	tttgcttcc	acttccctgn	cttccaacat	actgtcactt	540
actctggcag	tcttctgctt	ttcattaagc	ctcaaaatct	cctctgtcta	cttggcacca	600

caagctatgt	cctatatatg	nattttctgga	cttggcangg	atagttcaag	gggtcttggc	660
aagtttttat	ttaccttcat	tattttaaaan	gggccttttg	gggatgttgg	cctntttaag	720
gagccttttt	ggggaaatca	atacttctct	taanaa			756

<210> 557

<211> 742

<212> DNA

<213> Homo sapiens

<400> 557

tcgtcnaaan	nmatgtectg	gctatccgca	ggatccaggc	ggntcgaatt	cggcaccgagt	60
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cactantttg	actttttaag	taaaaantgt	aggggggttt	aaanctactt	tcctnctncc	180
aaaaantcag	aaagtttcta	nctttntaaa	ttgggaaagc	aagcantgtt	ttaaaancac	240
tgaaggaatc	tctttnttcg	ngnccttttg	ttaaactcgg	tttaagctgt	agaccttntt	300
taaantaaaa	tttaccacag	aacaggaaat	agaanctgtg	gaagactcga	aatacacctt	360
tgtncttctc	tgttcttcac	ctgctctctc	gctgtctcta	cacacacaca	cacaaacaca	420
cacacaccta	tatttgcatt	aaaaatgggt	agtaaaagca	gtgaagggca	aacagaaggt	480
ccattncatc	aagtaagagg	ttgaatataa	actggaccaa	gtcttaattt	tttatttctc	540
tcattcggat	ncgtttacta	atttctttgc	tagctttaag	acttttaaaa	cattcttttg	600
ccctggggagg	gagttgttta	cccctaaact	tggagaatcc	tggccctaga	ataaatgttc	660
cttttaaaacc	cccanggccg	gaaaattgaa	tncnctgtg	ccaaaaagga	aaaaannnaa	720
aaaaaaactc	gnngcctnta	na				742

<210> 558

<211> 730

<212> DNA

<213> Homo sapiens

<400> 558

gggtcnntaa	tntnnagcnt	gtnaaacccc	tgagncttnc	gggncgttca	caaagaaaca	60
tttaataggg	acttncaanc	aaataattnt	cggtttntca	ggtggcagca	agacaagatg	120
gtggatcccc	atgccattac	ctgctagact	caggggttnat	atactgtagt	ggaaagggtga	180
ttccgaagga	atgttgtaag	acaattgaag	tgcagtanca	tcaaagttat	ttgacctaa	240
ggcaggaggt	ncagtaagta	tccactttta	tncaagaaac	antagataaa	ctggaaatct	300
tggagccctt	cctggaactg	gggttaatga	gaagtcaaca	tgggtggatta	ncatggaaga	360
tggagttgct	tagtctccca	ttcaagatgg	agtttcttta	gcctccattg	atagggagtn	420
tttaacaaaa	ncangaaata	agtcctttgat	ccattgaatc	tctaagagtg	agcccttgat	480
gactcagggt	taaacagtnc	tgagacaatt	taggagatag	ttttgaagnt	caatttgaat	540
tgtaaaagggt	caggattttt	taactttttc	acatctttga	anaaaagccc	atagagcgca	600
agttttcagc	aaganctgga	aancnatatt	nctatggaat	taaatagctc	ctcagggcaa	660
tcaattnggc	ctggganaac	ataatgcttc	aanggctgan	gnaatctgga	atttctatgg	720
gatttcttca						730

<210> 559

<211> 743

<212> DNA

<213> Homo sapiens

<400> 559

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cggcagcaga	ggaaacaccc	ccttataaaa	ccatcatntc	aggctgggtg	atctgacaga	120
gctagacact	gtcaaacaaa	caaacaaaca	aacaaaaaaa	ccccatcaca	tctcatgaga	180
cttatttact	atcatgagag	cagctcagga	aacacccact	cccgtgattc	agttacatcc	240
cactgggtct	gtcccacaaa	ttgtgggagc	tacaattcaa	gatgagggtt	gggtggggac	300
acagccaaac	cctatcacca	tgtaaaataa	tatctaattt	gtagagatta	aagaacaaga	360
taacttaaat	cttggatgta	agttaagaga	gtgggtgtca	gagttaaatc	attttaagggt	420
tcattttattg	tctggacaag	aataaaattt	tgattatcag	gaaatacaag	taaaaccaca	480
gggagacatt	gnttatatcc	aaattgtcaa	aaattacaaa	gtcttataat	accaagtttt	540
gctganggtg	tggagcaaca	gaaacttttg	ttcactgggtg	ggtatataaa	ttgaataatt	600
tcagcttgga	cattacctag	caaaattgaa	ggctgtatac	gtacatacct	accaatctag	660
caattcactt	ctagatatta	agtcttgaaa	aactcacatg	tttccagaga	cgtgttaaaa	720
ggtggttaaa	tcattntgng	aat				743

<210> 560

<211> 833

<212> DNA

<213> Homo sapiens

<400> 560

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cgagggggtc	tgggtggagt	tccatccagc	agtgagtgca	ttttttcccc	agagcagtta	120
agggtcttat	taaaagccac	cactttgctg	aggcctgtac	aggccttggg	ggtttgggga	180
agagaantaa	ggcaggcact	tgtcccttca	gggagggact	tgtccntact	gggagggttg	240
gggttgacct	tggctccagc	agagataccc	agcctggcnt	ggaagggcag	gtcttgagct	300
tacgcttgac	tgaaggggca	agctgcaggc	ctcttctgcc	ttcccctgca	ttcaccaagg	360
acaagtagga	ccaagaagtc	aagggaaaag	tgccaagata	gatctattcc	catttctttc	420
ttccacctgg	agaattcctg	agctatgctt	caaacctctt	ttgggcccagg	gaaagactgg	480
gggacatttt	ttagtcaagg	atgctttaag	aaagtaaat	cctgcttggg	ggcccaggcc	540
ttctttttca	agggtctgct	tgtgaatgcc	caacccaaaa	aaagggggccc	ccaaggccca	600
atcccttact	tcctnggtcc	ccccaaaaag	ggatnccaan	ttgggggaatt	gggaaaactt	660
gggcanncac	ccnaanccca	ctttggtagg	anttnaccaa	cccaaccaac	ccaaaaccan	720
cccacccaaa	ttnaaaaaaa	ggccaaaacc	accaaccaac	cnaaacccnn	annnnnnnnn	780
nannnnnnnn	nnnaaaaaaa	ctttgangcc	ttttaaaaac	tntttngngn	ggn	833

<210> 561

<211> 773

<212> DNA

<213> Homo sapiens

<400> 561

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agccccact	ggtgcagcag	caagggtgctg	gctctgagca	cattgaccac	cacattcagg	180
gccaggggct	cagtgggcaa	gggctctgtg	cccgtgccct	gtacgactac	caggcagccg	240
acgacacaga	gatctccttt	gaccccgaga	acctcatcac	gggcactcgag	gtgatcgacg	300
aagctggtgg	cgtggctatg	gccggatggc	cattttggca	tgttccttgc	caactacgtt	360
ggagctcatt	gagtgangct	ganggcacat	cttgcccttc	cctctnaaca	tggcttcctt	420
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agtgangatg	aagcctcagg	gcttccttcc	ggcttggcag	actaacctgt	caccccaaat	540
gcagcaatgg	cctggtgatt	nccacacatn	ctttcttgca	ttccccgcac	cttccagaca	600
gctttggctc	ttgccctga	caggatactt	gagccnagcc	cttgccctgt	ggccaaaccc	660

tgaattgggc	cacttgccaa	acttgcnngg	gaaaggggtc	cttgaaacaa	ggggggccatt	720
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<210> 562
 <211> 655
 <212> DNA
 <213> Homo sapiens

<400> 562						
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cgaattcggc	acgaggccac	cggtctcttc	ctaattctgca	cattntatctt	tgggtatttc	120
tgggcgggca	gttcctttgc	atgtttcggg	agaggtttgt	tgatttgggg	cttatatgtc	180
aggcctttgg	tttgcgctctt	attttagggg	ttgtttgggg	gcctgggtgg	tcggcctcac	240
atgggaaggg	gatgggtagt	ggatgggggt	tctgtcgnat	cttgngggcg	gtgattttgc	300
tnnngnnctg	tttcacattc	ttccccctcc	acaagccaaa	tcgttcattt	ggntnactg	360
tgtggactgt	ctgagcttgc	cctgccagaa	aaatttgggg	ctaggcacc	aggtgcanac	420
tttgaagaa	gcantccacc	tgtgggtacc	gcatctcgtg	ngtccactg	gcaggctgaa	480
cctacttgaa	catggaaaca	gcatgccc	atggcaaagg	ggccnnnacn	nnngnnnaaa	540
tnnannannn	ncngacann	nnnnaatca	ngannntcna	cannnatcnn	annnnancnn	600
nncaantacn	ncnaaaacac	accnnccana	annnnnaann	nnnnnncann	nnnac	655

<210> 563
 <211> 738
 <212> DNA
 <213> Homo sapiens

<400> 563						
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atccactgag	ttttagtaga	aacggagagc	agctcttgaa	aggtatcttc	aaagaacagt	180
aaaacatcca	actttactac	aggatcctga	tttaaggcag	ttcttgga	gttcagagct	240
gcctagagca	gttaatacac	aggctctgag	tggagcagga	atattgagga	tgggtgaacaa	300
ggctgcccgc	gctgtcaaca	aaatgacaat	caagatgaat	gaatcggatg	catgggttga	360
agaaaagcag	cagcaatttg	agaatctgga	tcagcaactt	aggaaacttc	atgtcagtgt	420
tgaagccttg	gtctgtcata	gaaaagaact	ttcagccaac	acagctgcct	ttgctaaaag	480
tgtgccatg	ttaggtaatt	ctgaggatca	tactgcttta	tctagagctt	tgtctcaact	540
tgcagagggt	gaggagaaga	tagaccagct	tccatcaaga	acaagctttt	gctgactttt	600
atatgttttc	agaactactt	aatgactaca	ttcgcttatt	gctgcagtga	aaagngtggt	660
tgccatcgat	gaatgctgca	gaaatgggaa	gatctcaaat	tctttgctca	aaaacgtgaa	720
cttaaccaaa	atgatggt					738

<210> 564
 <211> 798
 <212> DNA
 <213> Homo sapiens

<400> 564						
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cgntgngtgt	gccaccacac	ccagctcatt	attattatta	ttattattat	tattttgaga	120
cgaagtttca	ctcttatccc	ccaggctgga	gtgcaatggt	gcgatactgg	ctcactgcaa	180
cctctgcctc	ctgggttcaa	gcggttctcc	tgccttgga	ggcacctgta	gtgtcagcta	240

ctcgaagctg	aggtgggaga	atcgcttgaa	cctggggggc	ggagattgca	atggtgtggt	300
ctcggctcac	tgactcgag	cctggcgaca	gagcaagact	ctgtctcaaa	aaaaaaaaaa	360
aaaaaaaaactc	gagcctnna	actattngng	aggtcgtatt	acgtagatcc	agacattgat	420
aagatccatt	gatgaagttt	gggccaacc	ncaacttgaa	tgcnngaaa	aaaagcttaa	480
ttgggaaaat	ttgggaatgc	ctatngcttt	atttggaaac	ctttntaagc	tgcaantaaa	540
acaagttaan	caccncccaa	ttggcntcca	ttttaatggt	tncagggttn	aggggggaag	600
gttttgggaa	ggttttttna	aattcncggg	ccnnggggnc	ccaatgcttt	ggggccccgg	660
gtncccaann	ttttgggncc	cttttaangg	gngggnttan	attggcccc	cttgggggna	720
aaancgnggn	anatacctng	gtccctgtg	nanaaatngg	nttcccntta	caaaatttcc	780
cacnnaatt	tnngnncc					798

<210> 565

<211> 744

<212> DNA

<213> Homo sapiens

<400> 565

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cggcacgagc	atgctggcca	gcacccctgc	ctgtgcaagc	tctggatgag	ctgtgtgccc	120
ctgccacnca	caccngcac	tccctgccag	cctggcctca	gggcctctga	tccatgtgca	180
ctggagtggg	gatgactgac	agggccactg	gggcattnnc	acgttaacag	cagctgccac	240
tggcaaaaga	agtactcgc	caatggtggc	atctcagatg	tgggcccagg	agtctgggga	300
gctactttga	acagggttat	ccattcattg	tcccacaaa	ggctatggag	cccacccacc	360
atgtgctgga	gtagtcaagg	gaaataagac	actctccttg	tccttgtaa	ctcaatcaac	420
aagcatttgc	agagcaccgc	ctatatgccg	gcgctgtccg	aagtgtctga	gatacagcaa	480
tgagctaagt	aagcactgac	ttcgtagaaa	accataacat	cggccatctt	tggaaaagag	540
aaaaacaatg	gagttactta	tttaaaaaaa	aaagaaagaa	agttatctct	tccanganag	600
gctagaagta	cttttctgct	ttttggccag	tgcccantgg	aatgcctggg	ttgggggaag	660
aagaagggac	tgggttaact	gtggtgcttt	tgttgtaaaa	aggcanctgg	cctttgtact	720
tgaggagaaa	natggagcct	tggg				744

<210> 566

<211> 756

<212> DNA

<213> Homo sapiens

<400> 566

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ctggctatgt	ggacgctggg	gcagagccag	gccggagtcg	aatgatcagc	caggaagagt	120
ttgccaggca	gctacagctc	tctgatccctc	agacgggtggc	tgggtgccttt	ggctacttcc	180
agcaggatac	caagggtttg	gtggacttcc	gagatgtggc	ccttgcaacta	gcagctctgg	240
atgggggcag	gagcctggaa	gagctaactc	gtctggcctt	tgaggtaatg	gggggtggcg	300
gtggtggggg	gtgcttantg	gctatgctca	ccccgctnca	ttangcctat	tttggctctgc	360
tgtttccaaa	tgcttctana	tctaggcatt	tggtatccaa	cctattgccca	cantgcctan	420
aactncanac	ccccngccnc	tatgntnana	cctacttggc	acaagaacaa	nnngnanacnt	480
tgnnnatatn	ccanaangnn	naanattaca	nantnttata	ataccaattn	ntnttgangg	540
tgttnnnnnc	anaaacnttt	gntnacngnn	nnnnntatna	atnnataatt	nnnnntttgn	600
nancannanc	tatgnnnaat	taaangnntn	tnnncnnnnc	nnnacnnnna	nnnnntttan	660
nnanttnenn	ttnnntnnnn	nnnnnnnnnt	tnaanaannt	nnnnnttnat	nnnnnnnnnc	720
nctnnaangt	ntntttnnnn	nnaatnnnnn	nnnnncg			756

<210> 567
 <211> 746
 <212> DNA
 <213> Homo sapiens

<400> 567
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 cagccagcag gagaggcaag aactggggga acacaggaac ctaggggagg aggggagcgc 180
 tgggcatcct caggctggcg gccaaacctg cccctggagg cactagagga gggcatctgt 240
 ctgtgggagc ccagagctgc agggaggagg agggaggagg tatctggtgt gagcgttgcc 300
 cctgcgacat ttgggaccac acaggtgggc ttccttattc cctgacaaaag cctctgtttc 360
 cagctcttcc gccctctctg gatgaggga cagaagtga ggaacaaaa gaagcagcag 420
 cagcacagt cctgtcgctg ggtgcggaga cagcctggca aagtcccact cagccatggc 480
 ctgatgcang cccagccct nctttcttgg gtgtcaaag actgtgtcct ggacatctga 540
 tgcaccacct gccctgcctg ttgcaaacgt gatgctccc gatggaatgg agaaactagg 600
 agactgggac aagcaaaang ctgcaaaaca cccagaaccc attcttagaa nactggagaa 660
 atgattgagg aatcattggc accgtggncc tgtgcttcat nacaaacacc ttnagaaca 720
 acttgggatt gaaaaaccaa gacant 746

<210> 568
 <211> 738
 <212> DNA
 <213> Homo sapiens

<400> 568
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 ctgggcagcc tacgctttcc ggataaaaaat ggcagaatga aagaaattat gagtggaaact 120
 agagaatagg aaagacatga accaacgccc aaaatgagaa agaaggacat ataaagaaaa 180
 agacaaatag aagtgaaaaa aatagactaa tggattaacg tcctgtcgt gtgacatttt 240
 ctgctatgga aatgatatta gacaaaaagc acttcaagt gttttcttat ttgagttcaa 300
 aatgggtcat aacgcagcag agataacttg aaacatgaac agcgcatttg gccaggaac 360
 tactaacgaa catacagggc agctgtgatt caagaagttt tgcaaagcag actagagcct 420
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 gctttttgca ggtgaaatgc ttncacacca gcaggatgca gaaaaatgct ttccaagagt 540
 ttgttgaatn cagaacatgg atgtttatgc tgcaggaatt aacaaattta tttctcgttg 600
 gcaaaaaagt gttgattgna atgggtccta tttgattaat aaagatgtgt ttgagcctaa 660
 aaaaaaaan nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 720
 nnnnnnnnnn nnnnnnat 738

<210> 569
 <211> 753
 <212> DNA
 <213> Homo sapiens

<400> 569
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 gctggaggag aggagctcag agttctacag agtctttnt gaacaatata agaaagctgc 120
 tgaagagggtg gaagcaaagt tcaagcgata tgagtctcat ccagtctgtg ctgatctgca 180
 ggccaaaatt cttcagtgtt accgtgagaa cccccaccag accctcaaatt gctccgctct 240
 ggccaccag tatatgcact gtgtcaatca tgccaaacag agcatgcttg agaaggagg 300

ataaaaactt	tcagaatgag	caaaacacca	tcaacgttaa	ttccagagat	ggaacatttt	360
ttttcctagt	gagaaaacaa	cccatttgaa	gagaagacc	taatgagaag	accctaaaaga	420
gagacatcaa	gaatggattc	agcagaatca	tttcacgttt	tgaacagcag	cagtttgaan	480
ggccaaagcc	tttgatcagg	gatcccgta	ttaaaggaca	ctcttgagta	ttagtaaacc	540
ctcttatgat	gattaaaaga	gaagggcagc	cctnttcacc	tttttgggtc	ttctattcaa	600
cttgccctgac	cataaaatgg	ttctcttctg	nacaaagccc	catcatttgg	tgaacctcac	660
ccttaacaaa	gtaggattgg	gggtgggggg	cttaattaat	tggaatgggg	ccaaggagaa	720
gagcccgaaa	ccttagatnc	canggggnana	agt			753

<210> 570

<211> 832

<212> DNA

<213> Homo sapiens

<400> 570

tnatnaataa	ggtttgantt	cttatgcttn	ccaanngctt	ggacctannt	anccangcgg	60
tggaattcgc	gcacgagcca	ggccccaata	atctgggntt	naaactttga	ggaaatgcca	120
gtgacttatt	ccagagtgcc	tcagttaggg	gaacttctct	gtaaagaacc	ctgggtattg	180
agcaaaaacc	ttattatcgt	taatgaccta	taattggaag	cttcctgcct	ttttctttgg	240
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aggggaggtg	gagagacccc	ttcagagcag	ggattgtgcc	gggagagtgc	ctctgacttt	360
gggacatttc	atccacagaa	attncaagc	caatggtttc	ttttgggttt	tggtttttta	420
tggttgnttt	ttgggggttt	ggaaaaacat	gcatttttac	cgtgcacgta	aaattggtca	480
nagaaaaagg	gagcccagaa	aangcagcan	atgggccatg	cccctttgct	gggttttccct	540
tttcttttgg	gactgtnaag	gggaaatggg	tttttanaag	gtgaaggttt	ggtcctgttg	600
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aaaaccctgg	gcccctttaa	naaactttgg	nangggaacc	cgggaaaaacc	cccttggggc	780
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<210> 571

<211> 748

<212> DNA

<213> Homo sapiens

<400> 571

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nnagcccatc	gatgcgaatt	cggcacgagg	ctaggattac	agggtgtgagc	caccatgccc	120
agccacttat	ctttaaaagga	ttaagtattat	gtttcctact	atgggaaacc	atcccacccc	180
aaacttgatg	accgcattat	gtgcttttat	agaacatggc	acttctccag	gatagcattt	240
attctgtttt	gtaagtgtga	atgtaattac	cctacacaca	gcatacacat	aatcttcata	300
ttctttgcct	tgtcttgtga	aggcaagggc	catgtctatc	ttattcgtca	ttagattccc	360
acatccaaca	tagtcttggg	gacagcacca	atgcactttt	ggtgcataag	caaatagtgc	420
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<210> 572

<211> 755
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 <213> Homo sapiens

<400> 572
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<210> 573
 <211> 743
 <212> DNA
 <213> Homo sapiens

<400> 573
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<210> 574
 <211> 737
 <212> DNA
 <213> Homo sapiens

<400> 574
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 tgtnatttct tatactntgt attttggntc tgtattatgc ttctgatacg ctataattat 180
 ttatgtccat gtncntttct tcaatagact gtgaactctt cgaatgtngg actcctagag 240
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 aacttcccaa atttctgctt tatctaggcn actctttaa ttcttttate tcatgtagat 360

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<210> 575

<211> 766

<212> DNA

<213> Homo sapiens

<400> 575

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<210> 576

<211> 761

<212> DNA

<213> Homo sapiens

<400> 576

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<210> 577

<211> 803

<212> DNA

<213> Homo sapiens

<400> 577

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gntaatcccc	ttcnacaaat	ttcnccaca	atcatttacc	aaacccnngg	gaggcctttn	720
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<210> 578

<211> 738

<212> DNA

<213> Homo sapiens

<400> 578

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<210> 579

<211> 758

<212> DNA

<213> Homo sapiens

<400> 579

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tcaagaaaca	gcctaaagga	cctgcctgat	gtgcaagagc	tcatcactca	agtgcggtca	180
gagaagtgtc	ccctgcaggc	cgaagccatc	cttgatgcaa	acgacgtcca	tcaaacagag	240
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gttcttaagc	aagcgtgtca	ngagagcacc	ctgttggcct	cttggtaaaa	tgtgtgcaag	720
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<210> 580

<211> 816

<212> DNA

<213> Homo sapiens

<400> 580

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caacttatcc	tatnctggcc	aaacatagaa	tgctttcggt	ttgcaaggta	acangatccc	660
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<210> 581

<211> 868

<212> DNA

<213> Homo sapiens

<400> 581

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<210> 582

<211> 745

<212> DNA

<213> Homo sapiens

<400> 582

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<211> 748

<212> DNA

<213> Homo sapiens

<400> 583

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<210> 584

<211> 773

<212> DNA

<213> Homo sapiens

<400> 584

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<210> 585

<211> 745

<212> DNA

<213> Homo sapiens

<400> 585

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<211> 749

<212> DNA

<213> Homo sapiens

<400> 586

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<210> 587

<211> 783

<212> DNA

<213> Homo sapiens

<400> 587

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acagtaacct	gtaaggcata	taaagtagct	attttagtaa	gataaatgat	attttatata	480
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<210> 588

<211> 771

<212> DNA

<213> Homo sapiens

<400> 588

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ccttatgta	tctgtgtca	tgtccaatca	gttgtaaaca	atggcatctt	tgaacagtgt	300
gatgagaata	ggaatgtggt	gttttaaaagc	agtgttgcat	tttaatcagt	aatctacctg	360
gtggatttgt	ttttaaccac	aaagatgaat	tatcaatgat	ttgtaattat	atcggttgat	420
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tctgaataag	tctctcataa	tgagtgcagt	gtcagactgt	gcctactctg	atgggtatngt	540
gccatttgta	aaatnanaat	aagagcagaa	aaaacacaaa	nangagaaca	ctggnttcag	600
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aaaagcttta	aaaagtttta	ttatccanac	ttacaaccca	ctanttaagc	taaataancc	720
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<210> 589

<211> 844

<212> DNA

<213> Homo sapiens

<400> 589

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caactgggtt	cccatggcat	gtgggtggcct	tagaggaggt	gttcagcctg	ccaccgtcgg	180
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acagcttcct	ccagcagcag	catgtgctgg	gggcccgggg	tggtcctggc	ccgactcaag	300
gggaggaaca	gccaccccag	cccccgctgg	accccagaa	cctggcaaga	ccgctgccc	360
ctgccagac	tgaggctctt	tcccaactgt	tctgctcaat	gaggacactg	actgccaagg	420

aggagcttct	gcagaccctg	cggacccacc	tgatcctnca	cgtggcccga	gcccacggct	480
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angaangntc	gnttatttct	aacaaaacc	ggnccttgnt	tentaccntn	ttccctntct	720
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<210> 590

<211> 767

<212> DNA

<213> Homo sapiens

<400> 590

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ccatagaata	cagattctac	agggattaca	agaaacatat	gaaccttctg	agcaccacgg	300
tttggcatag	aaatggtacc	ccttgttcaa	aatgaacaag	aagccttaga	tttggatggg	360
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cctggccttg	caagaaagcg	aagcctttct	gagagcagcg	tgatcatgga	cagagctcct	480
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gtttcaccta	gtaactcatt	ganggctgga	cagaaccaga	aagcaaccat	gcaccctcaa	600
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atgttgctac	cccaaagcg	acattnttgg	caccaaatta	tccctcttga	ccnntttaat	720
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<210> 591

<211> 765

<212> DNA

<213> Homo sapiens

<400> 591

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atgttaagt	gaaaaatata	cagtttggt	aaataaacta	gattctacat	ttatttggg	180
gtttttttcc	cctcctttct	ttccacagca	cttttgatat	caagcaagt	gcttcctttt	240
tgagatatta	aaaaaaaaa	gaaaaggaaa	aaagtaaatg	aagcccaact	acctaaccct	300
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caaatttctg	gttatcattt	ctcttccctg	tggcacttga	catttttaatt	gtcttaaagt	420
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tggaaatntg	ggtncatgta	angcaatcnt	tctggtgtaa	atcttccctt	ttttaatgna	660
catatanttt	tggaaaaaat	tttgaattaa	ccctgaaaat	ttttaaaaaa	gcctctcttan	720
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<210> 592

<211> 757

<212> DNA

<213> Homo sapiens

<400> 592

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gccccggccc	ctatacccca	gtgttctctt	tgatccagtc	ccgaaacaga	gggagccttg	240
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acccaactgg	gggcaaagg	ttgaagacac	agcctccccc	gccagcccca	agctggggccg	360
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tattttacctt	agatncagac	atgataagaa	tncattgatg	aattttggac	aaaccacaac	720
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<210> 593

<211> 766

<212> DNA

<213> Homo sapiens

<400> 593

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ngtgtgttgc	cccntntgcc	gtttcaaata	aaagggtttg	taccaccttt	tcaaaaaaaaa	720
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<210> 594

<211> 754

<212> DNA

<213> Homo sapiens

<400> 594

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ttctgacatc	ccccaaaaaa	aaaaanaaaa	aaaactcgag	cctctagaac	tatagttagt	360
cgtattacgt	agatccagac	atgataagat	acattgatga	gtttggacaa	accacaacta	420

gaatgcantg	aaaaaaatgc	tttattttgtg	aaatttttgtg	atgctattgc	tttattttgna	480
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aggttcangg	ggaggtnntg	gangtttttt	taattcngcn	ggcgcngcnc	caatgcattg	600
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cntaatcttt	gnncatnggt	tggnttntctg	nggnngnaaat	tggttttccn	ggnnanaatt	720
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<210> 595

<211> 767

<212> DNA

<213> Homo sapiens

<400> 595

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ctacnaaaaa	ttaacctngg	gcntgggttg	ctccgtgcct	tntaatcccn	gcttactcgg	720
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<210> 596

<211> 743

<212> DNA

<213> Homo sapiens

<400> 596

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agtggttgat	gagtcactctg	aagaaattca	gccccaaactt	nncaacctgc	ccttctctgnt	720
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<210> 597

<211> 786

<212> DNA

<213> Homo sapiens

<400> 597

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<210> 598

<211> 809

<212> DNA

<213> Homo sapiens

<400> 598

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<210> 599

<211> 759

<212> DNA

<213> Homo sapiens

<400> 599

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gaaacttcaa	gcaaattgga	aaaagaaact	tgtaagaaat	cacaccctat	tctatatgtg	180
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tttagactat	gttgtaaaaa	tggggaaagg	ttgtaaacta	tgtngtaaaa	aatngggaaa	660
tgtggcttta	aaatatatnc	attatatttg	gttcaaggat	tttggcaggg	gntaaaggaa	720
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<210> 600

<211> 769

<212> DNA

<213> Homo sapiens

<400> 600

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acagatgcct	gtgcacaaa	gttcacggca	gcacccctcg	ccatagtggc	agcatccgtc	180
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gaaggaaatg	tttttgatat	tggggccggt	tgggtgatnt	ttgcattacc	ctttgaatat	720
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<210> 601

<211> 755

<212> DNA

<213> Homo sapiens

<400> 601

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aagtccatat	ttgangctgt	gggcttcatt	gnnagcancg	nnggacttnt	nctgggcata	360
gctttggtga	tnagagtggg	tgggtgctgn	anctnctggg	tcangcanct	atttctggcc	420
agcagatgta	nnctatatct	gtgattactg	gcacttggct	acagagagtg	ctggataaca	480
gtgtagcctg	cctgtacagg	tactggatga	tctgnaanac	aggctcagcn	atactcttac	540
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<212> DNA

<213> Homo sapiens

<400> 602

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<212> DNA

<213> Homo sapiens

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<211> 801

<212> DNA

<213> Homo sapiens

<400> 604

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<211> 759

<212> DNA

<213> Homo sapiens

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<212> DNA

<213> Homo sapiens

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<211> 788

<212> DNA

<213> Homo sapiens

<400> 607

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<211> 796

<212> DNA

<213> Homo sapiens

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<211> 790

<212> DNA

<213> Homo sapiens

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<212> DNA

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<210> 614
 <211> 754
 <212> DNA
 <213> Homo sapiens

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<210> 615

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<212> DNA

<213> Homo sapiens

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<212> DNA

<213> Homo sapiens

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gtggatngtc	aanngcactc	ttgtggggcca	cacaanagat	tccttttttg	cctgcaanac	660
cntgtntgaa	acccccttaa	cttatngccn	atntnctna	agcaaccctt	aggcnanttg	720
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<210> 617

<211> 766

<212> DNA

<213> Homo sapiens

<400> 617

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ccaggtggca atcatgagtg aatggatgaa gaaaggcccc ttagaatggc aagattacat      180
ttacaaagag gtccgagtga cagccagtga gaagaatgag tataaaggat gggttttaac      240
tacagacca gtctctgcca atattgtcct tgtgaacttc cttgaagatg gcagcatgtc      300
tgtgaccgga attatgggac atgctgtgca nactgttgaa actatgaatg aaggggacca      360
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cccaccatat ggggtccaca naantgcagc atctctaata aganttatte ttgcccttng      600
ttcaangatc ttattgaaag gacatcttac agcttttccc aatgagaang cccangaagt      660
gttaaacata ctgnnttgaa aaaagcactn tatntntcc cntnttaana tggnttctaa      720
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<210> 618

<211> 762

<212> DNA

<213> Homo sapiens

<400> 618

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tccaacctca gctcctgag tagctaggac tataggcaca cagcaccatg ccccggtat      180
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gtacctggcc cttggtggaa tctttagggt tttctattca tacatataaa atcatatcat      360
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cttgccctaac tgcctgtctc agaactccca gcactatgct gaatagagtg gcaagagcag      480
gcatttgcct tgttcctaac cttagagaaa aatccttcag cctttttacca ttgaggatga      540
tgtttgctgt tagtttttca taaatgatct atatcaggct tgaataaatt tctatttcta      600
aaaanaaaaa atataacnnn ntanttnatn aantnnttaa naaanaaaaa actggnacct      660
ntaaaactta tagtngagtc gtttnaccgt anateccana ntttgataaa gatacattgg      720
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<210> 619

<211> 754

<212> DNA

<213> Homo sapiens

<400> 619

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gccggccacc tggaggggca ttgcttgggt cgcgtggtag cagaggagct tgagaatgtt      180
cgcatcttac cacatacagt tctttacatg gctgattcag aaactttcat tagtctggaa      240
gagtgtcgtg gccataagag agcaaggaaa agaactagta tggaaacagc acttgccctt      300
gagaagctat tcccaaaca atgccaagtc cttgggattg tgacccagg aattgtagtg      360
actccaatgg gatcaggtag caatcgacct catgaaatag aaattggaga atctggtttt      420

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gctttattat	tcctcaaat	tgaaggaatn	aaaatacaac	cctttcattt	tattaaggat	480
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ctgaacttcg	tgtgggtccct	tgtcttttgg	tataaatgct	gtaagggtgg	agccantaat	600
tntctgcaan	aagtangnca	gcacttttca	gtgatttgaa	tatcatcttg	gcttngangc	660
cangtggaac	accttgtcat	aactgacttc	tgaagaagaa	cctntngata	tttgatgcct	720
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<210> 620

<211> 767

<212> DNA

<213> Homo sapiens

<400> 620

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tgttctttgt	natcctcctg	tgagctctct	gtaagtcnnt	ttcttgccca	tcaccacatc	180
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aaacccccag	taactgccaa	tctcacttag	aataaaatcc	ggactcctgt	gaagcacagc	360
ataaactggc	cactgcctat	gcagcaacct	catctttacc	gnttcctgcc	ttgtctactc	420
ccttcacagc	cgttatttct	tctgatggcc	cctagtacac	aacaactcct	tcctgtctcca	480
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nctatnatgc	cctactcatt	tccagtcctt	gaaanggcc	ttcccacttn	antannactt	660
attgctaacn	tgaatacac	taaatgnnan	ccttcatgaa	nggtanggca	anttaaatac	720
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<210> 621

<211> 828

<212> DNA

<213> Homo sapiens

<400> 621

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tncttaaaca	tatgtgaaca	aaaatttngt	gatggaagga	ttctagttaa	tgagtattgc	180
atcaagattt	acatctttct	tactaaggaa	aagagttaat	aaaaatngnt	ctttatttta	240
caggcagnta	ctgaggctct	tcccanntcn	cagtanacag	ccactcagcc	ttgaaaatgg	300
agtgttgttg	tttctaaaca	tatatttatg	tcatttattn	aggtacagtt	cacttaaata	360
accataagtn	gantctctct	tgtnagtgat	ttgggttaga	agaggccatg	tctanagttc	420
natttctctg	ttgggtccna	ntgaaattgg	accttttnag	ttgttcanaa	aaatnaanat	480
aaattnctca	tattaaatca	agannctcnt	caanttatag	atgtggggta	gggttccnng	540
taaaacccat	tatnaatcta	gaaaattatc	nctatngana	angcntttta	tatctnttac	600
cntgaaattc	attacttttag	tncaaggcct	accttttaan	gtttnnncnn	gaaccatttt	660
tannnnntcn	ncttttgnnc	caananntca	ttttaancca	ccaaaantcn	caattntnt	720
tncattnnaa	tannggatgn	naattatnnn	atcnatgtgt	catatttnac	canganaata	780
ctgngctnnc	tgnaataatn	ggtacactaa	anncnngann	tttnntcn		828

<210> 622

<211> 784

<212> DNA

<213> Homo sapiens

<400> 622

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agtcagaatt tatagctttc actatgtcca agactaggac tgggttataa agattttctt      180
ttgtgaagga aaataaaaga aaatttgcca ctactgcatt tactttacta ttgtaaaactt      240
aagattcatt ccttagtctt tggaattttg atgtctcaaa accagatgag tggaagtgtc      300
gaatttgcaa aataaagcta agaatgctta actctgcact ttaagttcta ctctgaccaa      360
attgaagatg agcagagcag ccctgaacag catttngttt atacagtctt gtttaagaat      420
agaatttttt taactcttca tttnttgctt ctgtggaagc tgtgtaactc tttttaaaat      480
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atnggtattg ntacgtgtga ccttatgtat tncctgtacc tgaacacttg atgctgcctn      600
acangaaaat agaactttat gttaaaaaat aaaagtctgg tncctctttg naaaaaaac      660
nncnctnctn ctcaaaatcc ncnacannnc tnnnaatntn ctaanntnag tctnnnttnn      720
ngcanncttn tnnnccnct nanctccctn tntcntnttc atatctanan tnacanccct      780
ccct                                         784

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<210> 623

<211> 1164

<212> DNA

<213> Homo sapiens

<400> 623

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ttctntttct ntnatnnaca ngngaaant ccaggnnacc ntgnnnccnt atctgantna      180
ngctngnttn aacntngnna caccnngnct nnaaancaaa tttnaaaaaa ggganancn      240
nanancatnn nanntnncca atctaccaa atcanaaac ncantgaaca acacananna      300
tnnnatacnn tctacncaa ancnnncat nncacgcacg ataanacanc nnnnaaaaaa      360
ancnaancan atatcanann caacctana cnannaatca nacnctnanc tccncacag      420
cannngnacn aanaacnanc antgataaan cncacctnnn tannacacac ctnannancc      480
nntntantcc cgaataacca atngccacnn ctannccnat aacanantcn ctnanccctc      540
ntgcatcaaa ttantaaatt cncnancata aagnanatca cagcctcntt cnaccnntga      600
tcnaantnt anaccnangn nanncnntat naaacnctat ancantnnna ctnnaacntt      660
nnatcngcnc ntanaaatta aanatcnaa actcaatatn ncggaatant nncntctcta      720
nataannnta naacggngna aanacnctc anacataann gncntacnna tegatctatc      780
anntnancat aaagtcaccc gcataatnac cnacgnncaa cataannnaa atnctactct      840
cagaccatat aaatntcgcn tccntanacc agngcnanan tacaanacg tcgcnnnngt      900
ntggaccaca cgnctagat aaacacnnat aaacantttt tanatgtaac acatttcnna      960
tctatnaaat ancatcattn atgnanacga tnacaacaaa nnctacnna tgnactaaa      1020
nacaantaaa nntnanatta aaaaagttgc aannatncng ngaaanntcc cnanaaacan      1080
tanatnenta tttannntn acnncggngt nncntaaaa anaactctnn nntnctggn      1140
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<210> 624

<211> 798

<212> DNA

<213> Homo sapiens

<400> 624

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tgtgtcattc	caaggtttct	tcatgagtca	ttccaagttt	tctagtccat	accacagtgc	180
cttgcaaaaa	acaccacatg	aataaaagcaa	taaaatttga	ttgttaagat	acagtagtgg	240
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acaattagtc	taactctgca	tagacagggg	ctagattttg	ttaacccaaa	tgtataactg	360
cagttagctt	aaattacaat	ttgaagtctt	gtggnntnta	tatagctngg	cactttatta	420
ctcttttgaa	ctgaaagcac	actcccttat	aggttcatgt	aactgtcctg	taataaggtg	480
cttataaatg	ggaacaacta	cacagcctag	ttttgncaca	accttttagca	tctaaaaaag	540
ttttaaagc	ttcttaaatg	nctaataataa	anggagatgc	tnatanccac	aacatctatt	600
ttaccaatat	tngtttcctt	acacttacct	tgggantttg	cattgagtga	ngttttngta	660
aacccccaan	atnccccatta	atanaaaaaa	nttggtagct	tttnatgact	ttaatccann	720
ttnccttgng	gnnttcncct	aaaangcttn	ccnnnggnnt	ggaantnnna	ntnatttntg	780
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<210> 625

<211> 793

<212> DNA

<213> Homo sapiens

<400> 625

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ctctgcatgc	aacagtaaaa	attaataataa	tattttcccc	acaaaagaaa	cacttaacag	180
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gaaaaataaa	attaatgaaa	acacagcact	tatgttggtt	tagctgcagc	ctccttggag	420
gtagaatttta	tttattttaa	attactgggt	gcatacaaga	ccccataggg	tgtacaaaag	480
gttctataaa	atctgcatta	tagagacaaa	gangcaggca	aatncatgtc	acaagggtna	540
agcttacagt	ttacaaaactg	gggaacgccc	agggtgtang	atttnaaaaa	cgncactctt	600
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gnccttgctc	aaacccaaat	ttnttggnat	ttgccagatt	ccttantntt	gccatgggcc	720
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<210> 626

<211> 825

<212> DNA

<213> Homo sapiens

<400> 626

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anttacatag	tgatnaatac	ccatctatgt	actgnngcct	nctaaatgtn	tntctncnnn	180
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gctgntcct	nnttcacgct	tancacttat	natatgatcc	cactattcac	tnantctctg	360
aagcttaaaa	cctangattc	atgcttgact	actgnataat	nntacaatct	actoctaatg	420
cattagcaat	tcttgctagc	tctacettca	aaatatattc	tgaatagact	atntcttgcc	480
gnttcccttg	cctncncatt	tcccatctgc	acccttcttc	tncncccaa	aatcaatata	540

ctagntgttt	ctaaaaaaaa	tatnganann	tagnnnaaaa	ncntaaataa	atntaaaana	600
angnntancn	tnacanaana	ttntaatat	aggnnanntn	ntgncaanaa	cnntaantnt	660
tnaatcacgn	aaaactctct	cnaangann	aanntatnnn	agttaaaagn	naaatannnn	720
aanantncca	aatntanaag	ataangncat	aanntatna	gncnnaacgc	taantgnnga	780
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<210> 627

<211> 772

<212> DNA

<213> Homo sapiens

<400> 627

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ncctgacggg	tctgcagcat	gccggccgca	tcctgactac	caggatccat	gagcttaaac	420
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gtgccaaaca	atgtgaggag	aacacctact	gctttanctc	ngaccgtgag	acacttgctg	600
ntnccntttg	gcaaagacca	tcattgganga	ncanntnggt	nctnaancng	nttggccaac	660
atnctcatca	acctgtattg	gcatgnaccg	cncttgctgn	acnncngngc	caaancnctc	720
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<210> 628

<211> 808

<212> DNA

<213> Homo sapiens

<400> 628

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<210> 629

<211> 827

<212> DNA

<213> Homo sapiens

<400> 629

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<210> 630

<211> 793

<212> DNA

<213> Homo sapiens

<400> 630

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caactntng gattacnnc aactccanaan atccgacggc atnnaanang caaaacaaca      720
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<210> 631

<211> 752

<212> DNA

<213> Homo sapiens

<400> 631

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aacataaaag aataagagct ccttaaagat tataaataaa tggatgatgt aaagtaatat      180
caccattgga cgaagctagg gaatcaacac ttgacagaaa gatacatatt ttttttatac      240
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<210> 632

<211> 751

<212> DNA

<213> Homo sapiens

<400> 632

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<210> 633

<211> 806

<212> DNA

<213> Homo sapiens

<400> 633

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<210> 634

<211> 775

<212> DNA

<213> Homo sapiens

<400> 634

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tattnngett	aaatttngnn	aaccatttna	taaagnctng	cnantaaaan	aaagggttaa	720
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<210> 635

<211> 784

<212> DNA

<213> Homo sapiens

<400> 635

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agtagagaga	aactataaat	ataaatttgg	aanggggttag	ctaaaaggag	aaaacagcan	360
aatcttcata	tatatanaaa	tggatattaa	tttgctagaa	ttaanagact	gcaggtaaag	420
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<210> 636

<211> 765

<212> DNA

<213> Homo sapiens

<400> 636

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caggccaacg	tgcagnggct	tgaaggagta	ccgctccaaa	ctcatcctct	tcccaggaag	480
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<210> 637

<211> 853

<212> DNA

<213> Homo sapiens

<400> 637

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ttangcagtc	aaaaaaacca	agcaagcata	aaaggtcaat	aagttgtaat	cttgatagta	480
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gcaagtatgc	catattatac	ccaaaagtgc	ttttaaaaaa	atatttccca	ttcaaccat	600
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<210> 638

<211> 740

<212> DNA

<213> Homo sapiens

<400> 638

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<210> 639

<211> 774

<212> DNA

<213> Homo sapiens

<400> 639

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tatgactnan	ctgactnana	aagatcactn	atctttccac	acttgnnggg	naggagccnn	660
tannangttc	aatatgcntt	ggtngantcc	catngctaca	atttcatgga	cacantttga	720
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<210> 640

<211> 743

<212> DNA

<213> Homo sapiens

<400> 640

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<210> 641

<211> 740

<212> DNA

<213> Homo sapiens

<400> 641

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<210> 642
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 <212> DNA
 <213> Homo sapiens

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<210> 643
 <211> 748
 <212> DNA
 <213> Homo sapiens

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<210> 644
 <211> 759
 <212> DNA
 <213> Homo sapiens

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<210> 645

<211> 766

<212> DNA

<213> Homo sapiens

<400> 645

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naatccaaaa	naattggcaa	accaggggaa	aagtaggtnc	ctncnggaag	tttcgacagc	720
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<210> 646

<211> 752

<212> DNA

<213> Homo sapiens

<400> 646

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gggtccctt	ctcgtccgcy	gcctcaccac	tctggtttta	gtcaacagcg	catgtggctt	180
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<210> 647
 <211> 743
 <212> DNA
 <213> Homo sapiens

<400> 647
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 gactgtcaca tgtggtttgc tgggtggcttc ccactggcga agagaagcta caaaatatgc 180
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<210> 648
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 <212> DNA
 <213> Homo sapiens

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 aatgttttagc tgggagggct gtagggaccc ctgttacccc cattaaacac agtaaagcat 180
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 tgntgacacc tatntgagct tcanttnct taacttgaaa aattgaacan gcccggtncg 660
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<210> 649
 <211> 746
 <212> DNA
 <213> Homo sapiens

<400> 649
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 atgatagata ccatccaaag ccagtgttgc atatggtttc atcagaacaa cattcagcag 180

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<210> 650

<211> 789

<212> DNA

<213> Homo sapiens

<400> 650

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<210> 651

<211> 757

<212> DNA

<213> Homo sapiens

<400> 651

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<210> 652
 <211> 759
 <212> DNA
 <213> Homo sapiens

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 ncagggcagt ccctgagggg ccagcanggg ggctgactgc ctagtggctn aacctactga 300
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<210> 653
 <211> 820
 <212> DNA
 <213> Homo sapiens

<400> 653
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 tnnntantna tctnaancct aaatgntcac atnnaaactt tanangncat cnnnnatgna 720
 accnancnat ggctaaang cctcattaan gccngntttt tcaaacttga aaantgcatn 780
 ccnccattga naaagganta cacgggcccc cntgngnggg 820

<210> 654
 <211> 768
 <212> DNA
 <213> Homo sapiens

<400> 654
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 aagagcagtt acttagggc aaattaagtt gtaaaatccc ccccgaggatt ttgtatgtaa 180
 gtcaaagtga attgtatttg gaagaagaac tggggagccc acctctggtta ttttttttat 240

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gaatcaggag	agcagatttg	gagactcttt	atattttata	attgagagag	acaaagagaa	420
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ttttaccaag	taaantgtct	ggaccaacca	tnatgcaggtc	caaaannctg	gaaaaaccgt	720
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<210> 655

<211> 752

<212> DNA

<213> Homo sapiens

<400> 655

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gaacagatgt	aatattgctg	atttaacagt	ttagggatac	tccccaagtt	caataatfff	300
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cttgtttata	tgtttgaaga	catacatatt	tcacatttca	gaagagtcta	tacatagctc	420
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gccttccaag	tagcanggac	caccaggtgc	acccactat	gcccagctta	attttttgna	660
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<210> 656

<211> 754

<212> DNA

<213> Homo sapiens

<400> 656

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<210> 657

<211> 734
 <212> DNA
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<210> 658
 <211> 783
 <212> DNA
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<210> 659
 <211> 741
 <212> DNA
 <213> Homo sapiens

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<210> 660

<211> 734

<212> DNA

<213> Homo sapiens

<400> 660

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<210> 661

<211> 762

<212> DNA

<213> Homo sapiens

<400> 661

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<210> 662

<211> 745

<212> DNA

<213> Homo sapiens

<400> 662

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<210> 663

<211> 748

<212> DNA

<213> Homo sapiens

<400> 663

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<210> 664

<211> 785

<212> DNA

<213> Homo sapiens

<400> 664

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cattaaattc	ttgaggaang	aaaatgacct	attatcccc	ataaagaacc	tgaaacttca	720
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<210> 665

<211> 763

<212> DNA

<213> Homo sapiens

<400> 665

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acattggccc	tgaactattc	tgtttgtttt	cataaagacc	ataacattga	agggaaagcc	300
caatgtttgt	cactaattag	cacaatcttg	gaagtagtac	aagacctaga	agccactttt	360
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gaaacagaaa	taaaattttt	gcactgctna	aannnaaann	actttccagc	naanctaaaa	720
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<210> 666

<211> 759

<212> DNA

<213> Homo sapiens

<400> 666

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taaaattatt	tattggacta	aaaactaaca	gaacttcatt	tccagaattt	ttttttttgg	360
caaatgttta	cattcaatta	aggggaaaaa	gtagaaccag	cacaaatgag	tggcagttgc	420
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<210> 667

<211> 760

<212> DNA

<213> Homo sapiens

<400> 667

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cggactatct	gtaagtcntg	tncagaacat	gatcaaagg	tgttacactg	ggctttccgt	720
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<210> 668

<211> 763

<212> DNA

<213> Homo sapiens

<400> 668

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gatgccattg	agcaaaccct	tcagaggaga	aatagtgaaa	ccaaagtgcg	acgtagcacg	300
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acttcccaaa	aagccaaaag	aagaacaata	tgtacatttg	acagcagtg	atttgaaaag	420
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tnccggagaa	gatcctctct	ttaatgggga	aaggagagga	gctctcttga	ctggccttgg	660
gaaagggatt	ggaacataat	ggggagaaaa	gaaagccgta	attgacattt	tctggcanan	720
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<210> 669

<211> 754

<212> DNA

<213> Homo sapiens

<400> 669

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taaactctga	atcttctcat	ctgttnaaat	gtgnattaaa	gtatctacct	aactgagtng	660
tgantgtant	gaaagaaagg	ncatatntta	aaconttgaat	ttancaagcc	cacnctcgna	720
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<210> 670

<211> 752

<212> DNA

<213> Homo sapiens

<400> 670

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aaagagggga	tctgatgata	aaaaaagtag	tgtgaagtcc	ggtagtcgag	aaaagcagag	420
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aagctcaant	agttttttta	ttattattat	tattaaaagt	tattcaggac	tgatgtgact	720
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<210> 671

<211> 752

<212> DNA

<213> Homo sapiens

<400> 671

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atthtgaact	tattgttata	gggcctgccg	tatggcttag	gatatttgag	taatcatata	180
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antttgccac	tttctccgan	gtaantttgg	ctggctcttn	agtaatgcta	attngtgtgc	720
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<210> 672

<211> 792

<212> DNA

<213> Homo sapiens

<400> 672

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<210> 673

<211> 755

<212> DNA

<213> Homo sapiens

<400> 673

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caattgcatt	cattttatgt	ttcaggttca	gggggagggt	tgggaagttt	tttaattcgc	600
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taattgcnc	ccttgccgt	aatcatggta	atagctgttt	cctggtgnga	aattgtttcc	720
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<210> 674

<211> 753

<212> DNA

<213> Homo sapiens

<400> 674

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<210> 675

<211> 760

<212> DNA

<213> Homo sapiens

<400> 675

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<210> 676

<211> 751

<212> DNA

<213> Homo sapiens

<400> 676

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<210> 677

<211> 756

<212> DNA

<213> Homo sapiens

<400> 677

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aaaagtacca	ataatgagta	ggaaatcact	tctgcagtat	ttttggagca	ttttccttaa	180
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attttacaat	ccattatttt	tgaccactgc	tatgtgttca	agtagtatga	gaatgtgatt	660
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<210> 678

<211> 756

<212> DNA

<213> Homo sapiens

<400> 678

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<210> 679

<211> 747

<212> DNA

<213> Homo sapiens

<400> 679

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tatgcactct	atcagccaga	atttggcatt	tagctcttag	ttaaactctag	taaaggacag	180
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aaataattca	ngaaaactat	ggggaaatag	ttacatttca	caaaagatat	tttaaaactct	600
ttgtaaaact	tagataatag	agcctancaa	gttactttgn	atctaattgg	atacatttta	660

tgnttaattt taccaccata cattttatta atcaaaattg gttagcatgt gactcttttt 720
ggcttcanaa gttntcaaaa aaattat 747

<210> 680
<211> 750
<212> DNA
<213> Homo sapiens

<400> 680
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gagggcaaaa aggctcgggt gatggccacc attgggggtga cccgaggctt gggagaccac 180
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<210> 681
<211> 748
<212> DNA
<213> Homo sapiens

<400> 681
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gccgagattg cacttttgta ctccagcctg ggcaacgagc aaaaaactct gtctcaaaaa 180
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cttttagaaa ntattaaatt tnaaaatgaa ttcnatanaa atanaannac naaaaaactt 720
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<210> 682
<211> 755
<212> DNA
<213> Homo sapiens

<400> 682
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catgaccaca	gatatcaatg	cactgaagcg	gcagtactct	cgaattaaaa	agaagcaaca	180
gcagcaggtt	catcaggtgt	acatcagggc	agacaaaggg	ccagtgacca	gcattctccc	240
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gactaacaga	gctgccaaga	atgctgtcat	ccacatccct	ggtcacacag	gagggaaaat	360
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tccgagtgca	caaaaagaac	atgccaagga	ccaagagtca	tnccggctgt	ggggacaccg	480
tanggtgat	agatgagcag	aacgaggcca	gcaagaccaa	tgggctgggg	gcagcagagg	540
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gtccaggagg	accnncnaag	ggcagtttcc	ggagcccgtt	gttccggaga	tgctgatgtg	660
ggntgtgtct	gcanttcang	gccaaanttg	gggacccctg	ggaactgtac	cctangggnt	720
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<210> 683

<211> 755

<212> DNA

<213> Homo sapiens

<400> 683

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ttttctacta	tattaagatc	taatgaattt	gatttctttt	ttgaagtttt	ttcttgtaac	180
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gcagcagtg	gtcagataac	cctgtggcag	tgacacgggc	aaattggcat	ttgaataaag	480
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ttggtttact	gagatgcttt	tgtaaaggaa	aataatgctt	gngacanttt	agtaatttct	720
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<210> 684

<211> 774

<212> DNA

<213> Homo sapiens

<400> 684

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gaaactcttg	agcaactaag	tgaatttaat	gattcactaa	agaaaattat	gtctggaaat	180
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cattcaatta	accctnagga	aaaaagccga	ccttanaaat	ttaccttant	gcnttgnnnn	720
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<210> 685

<211> 759

<212> DNA

<213> Homo sapiens

<400> 685

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tcatgagtga atggatgaag aaaggcccct tagaatggca agattacatt tacaaagagg      180
tccgagtgac agccagtgag aagaatgagt ataaaggatg ggttttaact acagacccag      240
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ggaaggacat cttacagctt ccaatgagaa gccaagaagt tgtgaacata ctgattgaaa      660
aaagacttta ttttaatccc tcattaaaaan ggttttaaat gttaaaaaaa aaaaaaaa      720
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<210> 686

<211> 749

<212> DNA

<213> Homo sapiens

<400> 686

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acagtgacct tctccatggg tcaaggactt ccttacaatt tctnctgagt taacttttgt      660
gaaaataatc ctaaggtttt ctggcttatt gaggaatttn ctacaaacaa caaaccaaca      720
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<210> 687

<211> 760

<212> DNA

<213> Homo sapiens

<400> 687

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ggntttctaa tgctttctaa taccttggct ctngctcttt ctgcaggatc ccatcgattc      60
gaattcggca cgaggaaatg tgtatttcag tgacaatttc gtggtctttt tagaggtata      120
ttccaaaatt tccttgatt tttaggttat gcaactaata aaaactacct tacattaatt      180
aattacagtt ttctacacat ggtaatacag gatatgtac tgatttagga agtttttaag      240
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<210> 688

<211> 752

<212> DNA

<213> Homo sapiens

<400> 688

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tgttccagaa cttattttg gggagtaaag tcaattgggc agaggatcct gcccttaagg	180
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<210> 689

<211> 806

<212> DNA

<213> Homo sapiens

<400> 689

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<210> 690

<211> 772

<212> DNA

<213> Homo sapiens

<400> 690

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<210> 691

<211> 755

<212> DNA

<213> Homo sapiens

<400> 691

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<210> 692

<211> 748

<212> DNA

<213> Homo sapiens

<400> 692

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agaaacacag aacaagtgtg cttctctcta tgttttccag aaatgacttc agtatctgga      180
gcatcctcag aaaatgtatt ggaatggaac tatccaagat cacgatgcca gttatattta      240
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<210> 693

<211> 881

<212> DNA

<213> Homo sapiens

<400> 693

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<211> 742

<212> DNA

<213> Homo sapiens

<400> 694

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<211> 745
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<210> 696
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 <212> DNA
 <213> Homo sapiens

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 <212> DNA
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<211> 728

<212> DNA

<213> Homo sapiens

<400> 698

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<210> 699

<211> 746

<212> DNA

<213> Homo sapiens

<400> 699

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<210> 700

<211> 759

<212> DNA

<213> Homo sapiens

<400> 700

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<210> 701

<211> 751

<212> DNA

<213> Homo sapiens

<400> 701

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<210> 702

<211> 748

<212> DNA

<213> Homo sapiens

<400> 702

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gaaatcagtc atcctgatgg aaaggtggaa aaggtttata agaatgggtg ccgtgttata      180
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gctgcccaga ccactcacac gacatacccg gagggactgg aagtcttaca tttctcaagt      360
ggacaaatag aaaaacatta cccagatgga agaaaagaaa tcacgtttcc tgaccagact      420

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<211> 769

<212> DNA

<213> Homo sapiens

<400> 703

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<211> 759

<212> DNA

<213> Homo sapiens

<400> 704

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<211> 777

<212> DNA

<213> Homo sapiens

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<211> 760

<212> DNA

<213> Homo sapiens

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<211> 856

<212> DNA

<213> Homo sapiens

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<211> 766

<212> DNA

<213> Homo sapiens

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<211> 743

<212> DNA

<213> Homo sapiens

<400> 709

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<210> 710

<211> 753

<212> DNA

<213> Homo sapiens

<400> 710

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<210> 711

<211> 718

<212> DNA

<213> Homo sapiens

<400> 711

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<210> 712

<211> 783

<212> DNA

<213> Homo sapiens

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<210> 713
 <211> 765
 <212> DNA
 <213> Homo sapiens

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<210> 714
 <211> 740
 <212> DNA
 <213> Homo sapiens

<400> 714
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<210> 715
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 <212> DNA
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<400> 715
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<210> 716

<211> 730

<212> DNA

<213> Homo sapiens

<400> 716

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<210> 717

<211> 728

<212> DNA

<213> Homo sapiens

<400> 717

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 <212> DNA
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 <212> DNA
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<210> 720
 <211> 740
 <212> DNA
 <213> Homo sapiens

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<210> 721

<211> 736

<212> DNA

<213> Homo sapiens

<400> 721

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<210> 722

<211> 751

<212> DNA

<213> Homo sapiens

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<211> 749

<212> DNA

<213> Homo sapiens

<400> 723

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<210> 724

<211> 761

<212> DNA

<213> Homo sapiens

<400> 724

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<210> 725

<211> 760

<212> DNA

<213> Homo sapiens

<400> 725

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gaanttcaga	ggaagtaact	ggaaagcaag	aagatcatgg	tataaaggag	aaaggggtcc	180
cagtcagcgg	gcaggaggcg	aaagagccag	agagttggga	tggggggcagg	ctgggggcag	240
tgggaagagc	gaggagcagg	gaagaggaga	atgagcatca	tgggccttca	atgcccgcctc	300
tgatagcccc	tgaggactct	cctcactgtg	acctgtttcc	aggtgcctca	tatctcgtga	360
ctcagattcc	cgggactcag	acagagtcca	gggctgagga	actgtcccc	gcagctctgt	420

ctcccttgct	agagcccatc	agatgctctc	accagcccat	ttctctactg	ggetcccttt	480
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ttattgtgaa	gtgtgttttt	aaatttncaa	atgtttangg	attttcatat	ctttcttatg	660
ctgattttcca	attggattcc	ttacaatgat	ttttgggttt	catctgctct	tggaatgatta	720
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<210> 726

<211> 741

<212> DNA

<213> Homo sapiens

<400> 726

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gatggcaatt	tgaagtagct	ataaaattag	actaatctac	attgcttttc	tcctgcagag	180
tctaatacct	tttatgcttt	gataattagc	agtttgtcta	cttggctact	aggaatgaaa	240
ctacatggta	ataggcttaa	caggtgtaat	agcccaacta	ctcctgaatc	tttaagcatt	300
tgtgcatttg	aaaaatgctt	ttcgcgatct	tcctgctggg	attacaggca	tgagccactg	360
tgccctgacct	cccatatgta	aaagtgtcta	aagggttttt	ttggttataa	aaggaaaatt	420
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gctgggatta	caggcatgtg	ctaatttggg	gttttttaata	gagatgaggg	ttttccatgt	660
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<210> 727

<211> 751

<212> DNA

<213> Homo sapiens

<400> 727

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ctctggagtg	agctaaattg	atcccaatna	agtttttctg	cttagcagac	agaaggata	240
attntttgac	accctttccc	acctgggtgc	tatgctaggc	ttgtcctgan	aacatncctc	300
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gaacaccaga	ggctacacag	tagctattcc	tgctactcgg	ttaatgagct	tggcaggttc	420
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aactccttga	tnntgggtac	catgtatant	ttgectttga	cntttaacgc	tttctacgat	600
anggtaanca	cncntttaat	ttangcnctg	gancattaac	tttctttgca	aaggctactt	660
atngccngnc	acaantgcag	cctcggacan	ancnnangnn	atatcctggt	ggccatggct	720
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<210> 728

<211> 765

<212> DNA

<213> Homo sapiens

<400> 728

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ggacatgctg	gagcagatgg	acctgatgga	catatcggac	cangaggccc	tggacgtctt	180
cctgaactct	ggaggagaag	agaacactgt	gctgtccccc	gccttagggc	ctgaatccag	240
tacctgtcac	aatganatta	ccctccaggt	tccaaatncc	tcagaattaa	gagccaancc	300
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acacactnac	agagangcca	ctcnngatgg	tgntnangac	agcaactntt	aaattgggac	480
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aagccaggtt	nnttnataga	cgttcttgat	tattacataa	ttgccaatca	tgtggtgagn	600
aacttgtgng	aacantttta	caattaantg	tgaagaccgt	acaangaatt	agttaaangc	660
natnnagggc	taaacaagct	attacttntg	annnaantta	angnatntaa	nnttttctgn	720
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<210> 729

<211> 743

<212> DNA

<213> Homo sapiens

<400> 729

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tcaccacccc	caccatgtcc	caggtgatgt	ccagcccact	gctggcagga	ggccatgctg	180
tcagcttggc	gccttgtgat	gagcccagga	ggaccctgca	cccagcaccc	agccccagcc	240
tgccacccca	gtgttcttac	tacaccacgg	aaggctgggg	agcccaggcc	ctgatggccc	300
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ccacctgctt	cctgccgtcc	cctggtgaga	aggccttggg	gaccccagag	gaccttgact	420
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cctgtntctg	tgggaagtgc	ttgtgcaaac	ctaaccaagt	tactaacccc	tctgntttct	720
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<210> 730

<211> 744

<212> DNA

<213> Homo sapiens

<400> 730

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cggcgntgtg	agtgtntgtc	atttcgcggt	tcttacaaca	gtacttgagc	tcactccgc	180
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aaagcngatt	tccaaggcnt	ctgcccagag	cnagcctttg	ntgannttct	ctttgccagc	420
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gangagtang	anactaaaag	aatgttgact	ctttgaatct	gctggataag	agactngaga	540
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ctatgcagga gaaaagccca tagttactgc gtgtnacaac aactntctaa cnaacattca 660
 ttaatccann ngannccctt caangaatgg taancctatg ccenttcaana tactgaactt 720
 nntgccactt ntggcaaaaa aaat 744

<210> 731
 <211> 746
 <212> DNA
 <213> Homo sapiens

<400> 731
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 tgtggtatat gcctttaatt ttatttctag agtgacaaat ttttggtttt gacagttttt 180
 ttctagcttt atagtttctt cttggggaga gaatatgtca acctcactcc atcatgctga 240
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 ctgataagta attgcagtat ctggtttcta tggttggatg attcaggatt ccaggaataa 360
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 tataaggact gcaaagtatg gccagggggg agtcngactt gggattggag agaaacagga 660
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<210> 732
 <211> 756
 <212> DNA
 <213> Homo sapiens

<400> 732
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 ggatccacca aaatggaggc ttcaccaagg tgtggtttgc catgaagacc ttccttacgc 240
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 tgtttcngac atcantggga agcaatccac ctgccn 756

<210> 733
 <211> 742
 <212> DNA
 <213> Homo sapiens

<400> 733
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cacgagctca	cacctgcttt	ggatgcttca	agcacctcag	ccctctgaac	tacaaaaacag	120
aagagcctgc	aagtgacaaa	ggaagtgagg	cagaggccca	catgccccca	ccgttcacac	180
cctacgtgcc	tcggattctg	aacggcttgg	cctcggagag	gacagcactg	tctccgcagc	240
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gcttggcgca	gagcgccacg	ggcagtgtgg	ctgctgcccc	ccaggaggcc	tgaggctggg	360
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gtggactttt	cgccccccaa	actgatgagt	nccggagaat	atatggagag	agagatgtaa	660
aaaaaaaaa	nnnnnnnnnt	ntnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	720
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<210> 734

<211> 749

<212> DNA

<213> Homo sapiens

<400> 734

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aatattttatg	ggcttaaaaa	gggggttttt	aaaaactgag	gatatcagta	ataaattgca	420
gaatattttg	caaagctttc	ttttggaaag	caaacttttg	tgccctgccta	tatgcaaagt	480
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<210> 735

<211> 770

<212> DNA

<213> Homo sapiens

<400> 735

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tagtagagac	ggggtttcac	catgttggcc	aggctggtct	tgaactcctg	acctcgtgat	180
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atctttcatt	ttacccaagt	cactttaccc	aagtaagtaa	ttaggggaaa	gcctgagtct	300
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<210> 736
 <211> 746
 <212> DNA
 <213> Homo sapiens

<400> 736
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 tatagataga tagatagata gatggataga tngatngatn gatagataga ttgataaacg 720
 gaattggggcc ttttgcttta atgaaa 746

<210> 737
 <211> 751
 <212> DNA
 <213> Homo sapiens

<400> 737
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 cccatcgatt cgaattcggc acgaggctga cctacagcag aagctgctgg atgcagaaag 120
 tgaagacaga ccaaaacaac gctgggagaa tattgccacc attctggaag ccaagtgtgc 180
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<210> 738
 <211> 795
 <212> DNA
 <213> Homo sapiens

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 acactcaagt ccccaaccca ctggaatctc ccctactaca agtgccatgt anacccttg 180

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<210> 739

<211> 763

<212> DNA

<213> Homo sapiens

<400> 739

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taccatatca	cattggcaaa	gacctccagt	atganattga	ataaangtgg	tganagaaaa	720
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<210> 740

<211> 765

<212> DNA

<213> Homo sapiens

<400> 740

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taaaaatgca	aaaattaacc	acgtatggtg	gtcacacct	gtagtcctgg	ctactgagga	180
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<210> 741
 <211> 753
 <212> DNA
 <213> Homo sapiens

<400> 741
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<210> 742
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 <212> DNA
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<400> 742
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 ganggtcttg atttttacnt anttgncaat aatgggttga gnaaacttaa agaaccagtt 660
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<210> 743
 <211> 768
 <212> DNA
 <213> Homo sapiens

<400> 743
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 aggnnnccac angcagcatg gcccatgnaa tgnccatgcc antgatggcn ggnggccatg 180
 ctgtcagcgg anncgactt gtgaggancc nntntggann cngtanncna canncacccc 240
 cagtctggna cccnagtgtt cttactacac caantgaaac gctggnnagc caagagcccn 300

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gnactatgtc catgnaaggg gaacatntan tggtgganna tgcnatgcaa ncntnnccnt      720
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<210> 744

<211> 757

<212> DNA

<213> Homo sapiens

<400> 744

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gtttcccttt aaatgcgttt agctagaaat ctatgtattt atccctttcc tattttgcat      180
tcttctccca ctatttttta aaactcattt acagtagaaa ccattcttct ttctcccaac      240
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atacgcgtag tgcactgag aatgtttgct cacagtcaat aattgtcttt gtggatgtga      360
taattttgga gatacacttc tggtcagaac tcaggtgaga taatcttgca atactccaaa      420
tgcagatact ccagccaccc gcaaggttcc aggaaaggac aatgtcctgc gagaaaatca      480
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gactcagcca tttctcatgc tgnnttgttt cttagcgttg ccacttaacc ccaaagaatg      600
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<210> 745

<211> 751

<212> DNA

<213> Homo sapiens

<400> 745

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gaaatgctgt tgaagcatat catttgcata aaaatcaggg acagtttcca agaattata      180
tatttttttc agttggctct ctagttagtt tttttgggag taaggacaaa cctggaatag      240
atagcaaaac tgaaaatcan cagtgtgat ggtggtacat atgtctttcc ttagcttct      300
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ggtgcatatc atgcattcaa gntatntcct aatttttggg ctgacagtgc atgtctttgg      660
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<210> 746

<211> 760

<212> DNA

<213> Homo sapiens

<400> 746

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attgctccca	aagagaaagg	ctttactggn	tntgtcangt	aaaagaagtc	cttcaangct	180
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gatgtgaaac	ggaagagcga	accangctag	caaaagagct	ttcttcactt	cgagaccaa	420
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ttttggaatt	ncagaagact	ttgactacct	ngactaaaat	attccatggg	ggtgaaagat	660
tttcaagctt	gngaatttgt	aaatttttna	ctattatcta	actaatgtnc	tgaattgccn	720
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<210> 747

<211> 786

<212> DNA

<213> Homo sapiens

<400> 747

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ctactatgag	gaggtgggtg	tacgtnctag	anggagatcg	agtacatgat	ccagaagctc	180
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tacatccact	cggagccact	gggcgtggtc	ctcgtcattg	gcacctggaa	ctacccttc	300
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<210> 748

<211> 722

<212> DNA

<213> Homo sapiens

<400> 748

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ttggccatga	tatttgaaaa	aggggaagga	tngccnaant	ttgtttacca	tttattccag	660
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<210> 749

<211> 821

<212> DNA

<213> Homo sapiens

<400> 749

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ctttgaaaag	ttgtnatggc	ggcgcatgac	tataaaatacc	ctagctggtt	agcatttaca	180
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ttaaagaggt	aaagcacatg	tttgccacaa	cccaggaaaag	tatttttaag	aaagatttgg	300
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tttattacta	gttcagaatg	agtggctgct	gaagggggcc	cccttggnat	tttcattata	420
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aaaggtgtgg	anttttccct	ttttaaatat	tccataattt	aantttccct	ttnaaaggcc	780
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<210> 750

<211> 770

<212> DNA

<213> Homo sapiens

<400> 750

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ctctcaaaat	gctgaatgca	aaagttggga	tcacagaaac	attgtgccta	tttttgggtct	180
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caaatcccg	attcctacga	acctatgtat	aggggggaaa	tatttaaggt	cccatttaat	720
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<210> 751

<211> 774

<212> DNA

<213> Homo sapiens

<400> 751

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<210> 752

<211> 778

<212> DNA

<213> Homo sapiens

<400> 752

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<210> 753

<211> 775

<212> DNA

<213> Homo sapiens

<400> 753

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<210> 754

<211> 1032

<212> DNA

<213> Homo sapiens

<400> 754

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<210> 755

<211> 798

<212> DNA

<213> Homo sapiens

<400> 755

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798

<210> 756

<211> 834

<212> DNA

<213> Homo sapiens

<400> 756

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<210> 757

<211> 1062

<212> DNA

<213> Homo sapiens

<400> 757

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<210> 758

<211> 845

<212> DNA

<213> Homo sapiens

<400> 758

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<210> 759

<211> 947

<212> DNA

<213> Homo sapiens

<400> 759

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<210> 760

<211> 759

<212> DNA

<213> Homo sapiens

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<210> 761

<211> 752

<212> DNA

<213> Homo sapiens

<400> 761

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<210> 762

<211> 1032

<212> DNA

<213> Homo sapiens

<400> 762

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<210> 763

<211> 817

<212> DNA

<213> Homo sapiens

<400> 763

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<211> 777

<212> DNA

<213> Homo sapiens

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<211> 774

<212> DNA

<213> Homo sapiens

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<210> 766

<211> 779

<212> DNA

<213> Homo sapiens

<400> 766

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<210> 767

<211> 799

<212> DNA

<213> Homo sapiens

<400> 767

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<212> DNA

<213> Homo sapiens

<400> 768

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<210> 769

<211> 802

<212> DNA

<213> Homo sapiens

<400> 769

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<210> 770

<211> 1157

<212> DNA

<213> Homo sapiens

<400> 770

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<210> 771

<211> 760

<212> DNA

<213> Homo sapiens

<400> 771

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agcccagagat	cgtgccattg	cactccaacc	agggaacaa	gagtgaact	ccatcttaaa	660
aaanaaaaaan	gaaaactcga	gcctctagaa	ctatagttag	tcgtattacg	tagatccaga	720
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<210> 772

<211> 777

<212> DNA

<213> Homo sapiens

<400> 772

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gcacacacct	gtaatcccag	ttacttggga	ggctgaggca	caagaatcgc	ttgaacccgg	180

gaggcggagg	ttgcagttag	ccaagatcgc	cctgctgcnc	tccagcctgg	gcaacagagg	240
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atattttaaa	aattgttctt	atgactagta	gataaattca	ttgccataat	gaggcttagct	360
cccagataaa	cagtgtattt	tcttcttttt	tttttttggt	gagtgggtcca	gagctttaag	420
ctacttttcc	agtagtttgc	cactttctcc	gaggtanttt	ggctgctctt	tcagtaatgc	480
taattgtgtg	tcaaattttg	tctacaacag	taggcaacag	atgaagataa	gttgggtgaa	540
tgtctccagc	actatgcac	cctattttct	atttattggg	gtacactcac	tttcagtaat	600
gngtttcaaa	ctggtatttt	ttaaaaaaca	aatcaatgta	aggactgaag	ttgaaatanc	660
caatgtaata	aagttaatta	gggttatttt	taaaaaaaaa	aaaaataana	actcnagccc	720
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<210> 773

<211> 782

<212> DNA

<213> Homo sapiens

<400> 773

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ttcgagcctc	aaaatttgct	gcacagaatt	tgcatcaaaa	cttaatcaga	aaatttccta	180
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cantacaagc	gctgcngtgt	nacctttgtg	ccccgacatc	agacgctgcc	agctnacccc	600
caatgacagg	ttcattttgn	tggccttggt	atnggcctct	naaaggnctt	tncccatna	660
aggaagccng	tggaaacttc	atcttgncct	gnantcgang	atnaaaaagn	atncagaacc	720
cggggaaggg	gaaaatcctn	aannctgact	tcccggtttc	caaaccagtn	ttgnaacaaa	780
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<210> 774

<211> 793

<212> DNA

<213> Homo sapiens

<400> 774

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ccgatccgc	agaggaactg	atgagtgtgc	aattgagagc	atagcagtg	cagccacacc	360
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ggggaattgg	tatattcaca	gactgtagac	tttcagcagc	aatctcagaa	gcttacaat	480
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tcaatcggcc	actggccatt	tttttctaag	tattcaatta	agtgggaatt	ttctggaaga	600
tggtcagcta	tgaagtaat	agagtnttgc	ttaatcattn	ggaattcaaa	catgctatat	660
tttttttaaa	aatcaatgtg	aaaacataga	cttattttta	aattgntacc	aattacaata	720
aaaataatgg	gcaattaatt	tttnaaaact	ttttaaaata	gnatgctcat	atttttaaaa	780

ataaaaanttt tnc

793

<210> 775

<211> 1009

<212> DNA

<213> Homo sapiens

<400> 775

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nan	nggcnc	ct	cgggggn	cc	ngtgntaa	gnc	natnctt	gt	ntntanaa	ag	ntggnnnt	180
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at	cttgnctg	ct	gnancctt	g	gggagcagg	nn	ctnggtng	tg	gtntctgcc	tg	cttgetgc	420
tn	gttccccg	gg	catgcgt	n	ncannaagg	gnc	atgcntn	gg	caanaag	gt	gcgtggnc	480
anc	gtnnngna	tn	nnnaggac	cac	cntgggt	cg	ngaatecn	t	gggttncct	gat	aggaacc	540
nt	naannnct	gc	ngntttta	tt	aatggga	nn	ananggt	nc	anttcaaa	gcc	agtnnaa	600
tg	cccttatg	ga	angngtg	nat	nacatan	cnn	ntatgt	gt	cntanann	ang	aaatcgt	660
tnn	ncaaatt	tn	nacaanaa	tnt	ttntaan	aa	agggtatt	tn	antntngg	tg	aaanaaca	720
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naa	antaacn	at	ncnaaagc	att	tacngct	tan	angtcen	cn	ngatactn	nc	anaatatg	840
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<210> 776

<211> 785

<212> DNA

<213> Homo sapiens

<400> 776

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aa	aggaaaag	act	catatca	ac	attgtcgt	cat	tgacac	gt	anattcng	gca	agtcac	180
ca	tactggc	cat	ctgatct	ata	aatnngg	tg	gnntcgac	aaa	agaacca	tg	aaaaatt	240
tg	anaaggag	gct	gtgaga	tg	gaaaggg	ct	cctcaag	tnt	gcctggg	tct	tgataa	300
act	gaaagct	gag	cgtgaac	gt	ggtatcac	cat	tgatc	tc	cttggtga	aatt	tgagac	360
ca	gcaagtac	tat	gtgacta	tc	attgatgc	ccc	aggacac	ag	agacttta	tca	aaaaacat	420
ga	ttacagg	ac	atctcagg	ct	gactgtgc	tg	ncctgatt	gt	tgtgtctg	gt	gtnggtga	480
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gg	cctacaaa	tc	nnnganac	aata	ancatt	tgt	gccatt	tn	ngggttg	ga	atgggtga	720
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<210> 777

<211> 1366

<212> DNA

<213> Homo sapiens

<400> 777

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aaagcaagaa	agaacagcta	aagnnngncn	cagaganagc	ttttangang	tntangaaga	180
aggaatanann	gngncaata	nnnnannnn	ngaaantatc	atganacnca	aatganggan	240
aaggcagcac	aagctgngca	aacagctatn	gngacggggg	ggccgggaga	gnctaaangn	300
cananatnca	atatataagg	actgcatgcn	aagggatacn	aaacaagnan	actnntctag	360
gaagaaataa	ntnttgacnt	ancnnacntt	cataacgaat	agcaccgtac	atcgagncaa	420
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ncntnanccc	acgcaactca	aaaaanattac	attanntaaa	aaagancat	ancaaaaacta	600
gtnttcaaaa	tngnacgagn	aaatgggnaa	nantttntnn	ccgggaaaat	tggnagagat	660
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ggctancata	gangagatat	ancnatnagg	ggatcaanan	cntaggnatt	ngaaaantaa	780
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tganagagcn	aaanaaanatn	aagggccttg	gngaaaangg	aaaaacagat	agngtcatnc	960
natatatncn	natgananan	tggggnaatn	taatctacnn	tanatnnggg	ggaaaaaaat	1020
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caacntgaga	nnnnacnang	atataaagcn	nnaggnagtn	tatangggca	tcacaaangg	1320
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<210> 778

<211> 775

<212> DNA

<213> Homo sapiens

<400> 778

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ctccagcctc	tccagagaga	caagatgggtg	aaggaactga	gcctgatgaa	gagtcaggaa	180
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atnaacaact	gggccttngg	aaagaaangc	nggccaagct	gcttgagtaa	tagtcaganc	720
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<210> 779

<211> 781

<212> DNA

<213> Homo sapiens

<400> 779

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ctttcataca	tactggatga	aggaagatta	cccttagatc	atatgtggac	ttattnaaac	720
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<210> 780

<211> 783

<212> DNA

<213> Homo sapiens

<400> 780

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gtagatccta	atgatcctca	natgttggcc	ttcaaccca	ggaaaaagaa	ctatgatcga	180
gtaatgaaag	cactggatag	cataacttct	atcagcnaaa	tgacacaagc	accatatctg	240
gaaatcaaga	agcaaatgga	taaacaggac	ccccttgctc	atcccttact	gcaatgggtt	300
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<210> 781

<211> 796

<212> DNA

<213> Homo sapiens

<400> 781

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caccgcctcc	acccttttta	aacccccag	cccttgctcg	tgagattggg	cttgggttagg	480
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annccccacc	ttnggggcca	tttttcccaa	ttaacttacc	cccaacccca	agncanggtt	720
nagggggnaa	agggctttcn	anttccatta	aagggggttt	gtttgttgnt	gttttaaacc	780
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<210> 782

<211> 886

<212> DNA

<213> Homo sapiens

<400> 782

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ggacacngtt	ntaannnnan	nagngnnngt	tttnnganan	agggnnnnna	gnngnannna	180
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gaganngnnn	gnngnggggc	atgangnggg	nncagaggca	cgaggagccc	aagaccatca	300
cngangagna	ngagcagggn	accnacatnn	acnnggacna	cgagaagngg	ggccagcgga	360
agaaggaagg	nagnacctng	agnaccgnta	ccaggaggan	cgggaccnac	agngacanag	420
gnccnnnncn	anacggannn	nanaaacgng	aagcaggann	nnnanggacc	aagggaaggg	480
nncngnncnn	ggaaaganng	ggaggagggn	ncgaaggcaa	aggggggann	cgnnannncc	540
aggaagnang	gaaggggggn	cgggagggna	annganaaga	ngaaccnngg	gggnncaggg	600
ggcgagggn	agcanaannn	nnccnnagnc	aanngaaggg	gananaagag	ngggaaaann	660
aannagaaag	agggaaaana	agnnaaggaa	anaaaagang	ngnnaannng	gganaaaaana	720
ngngganann	gnngganana	ngngnannan	aaaanngagg	aggncannng	gnaaanaana	780
nggggagggg	nganananag	ngaannagac	aaggaanagn	gaannagngn	anagnanngn	840
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<210> 783

<211> 805

<212> DNA

<213> Homo sapiens

<400> 783

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aagatgagaa	gacatcttgg	aagacttgaa	ttgggccttg	gaagaagaac	agccattcaa	180
atagatagaa	ttgtggtagc	aaaggcatac	ngntcggaaa	gtatagatct	ccagggacag	240
tagtcatggg	gttggggcac	tgttggaatt	taaggttgga	aggatatatt	ggagcccctt	300
gaatacggta	acaaggcaca	ccttgggcag	tggagagtta	tcagagtgtt	tgaaaaggag	360
ggttattgag	taaataaata	gactgggtact	ttaggaattt	taaaatgtgg	atcattgtac	420
tactaataac	tatntatttt	atatttacta	tctactaagt	aatttacctg	tattttcttg	480
tactgactgt	aaaccttctg	ggtgtgggtg	ttttaagtgc	cattttactg	ataaagaaac	540
tgangcttaa	atagntgaaa	tanntcacc	tgtagtgag	tggcacaatg	acaagtcann	600
atcttanggt	tgccnanntc	caaaanncat	ttaaanttnn	agnatnattg	annnttttnc	660
cttatggcnt	nnnaaatttg	gggagccatt	attgaaatcc	nttacnacnt	angaattgnc	720
caaaaaaat	actttttggg	gaaaactgga	tttattaatt	atccaaaata	atttnantgg	780
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<210> 784

<211> 776

<212> DNA

<213> Homo sapiens

<400> 784

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atcgattcga attcggcacg aggttatatt aaattattct ttgntnttct ttgtctttta	120
ataaagcctg caagttacta aattgnagtt ncataaattc ttagttnaag tatcatcttg	180
gcagngtgcc aaaggtgaaa angntgcttn ctctaacaga gaaattctta gngactccag	240
tcgtanaaaa acgtctttac aacctgaata agatnganga attgngaaca taccatggcc	300
tattggatga atcatttgcc gngggctana ncagactgta gggtttgatga tggatntatg	360
gagtatgtgg gtatagaaat catgaatntn ccatttgnnn ncagagattc aagcntanac	420
ttaatgggta gatcataaat gacagaatga attcaaaacc tagcacgtgc attgtaaatg	480
tgtgcccaga tatgtnttgg aaatggcagn tccttggggg catgtntcta ctggcaaaat	540
ttgctatagn gnnactattg nantgtaatt ataaaattna tcannattat ncaccgattn	600
gccaaagtaaa ctgtactgtg cataggaatt ttgggaattg tgcanaaatt ggatcaattg	660
aanttnagaa cngatgtctg ggcttaaaaa ttatcnggg accacnnatt angaaactna	720
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<210> 785

<211> 778

<212> DNA

<213> Homo sapiens

<400> 785

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atgtgcctga atgagtttga gtttccctgtt aactccaaat caacagtatt ttcaacaaga	180
aatgtgcaat tgaaatcaag tgctgtttta gtgcagctag gantccacag gaagacactt	240
gcagtgaaca gagttatgga gcagcaaaaa cacagatcta tttggaaaaa gagaaaacat	300
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aaaggacttt gatttctagg tagattctgg gtagagactt cctttcatat tgaggcatta	420
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ggtttggttg cagaatgaaa gagaagatga agtcaagaga ttggtttaga ggctctagca	540
gaagcttagt catatttcaa aatgatcaaa tatcaagaaa aattctgagc tgcataactt	600
gtataaagta attttcagtg atttttttca tggttatgat aaaagaactg gattagcaga	660
aacttttacc ctgaatcaag atttaatttt tctttgagct catcttaagg atatcggaac	720
atagggagca aacgatggtg tggtgcctc antgcttgaa ttttaacngt tttgaaan	778

<210> 786

<211> 805

<212> DNA

<213> Homo sapiens

<400> 786

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aggatcactt gagcttagga gttcaaatcc agcctgagcc aacataacaa gactttgtct	180
ctaaacaaaa cagttattgt ttaaagaatc tgaaatcttc atctttaatt caggtagccg	240
tgaatcgagc ccaagtttgt ttgatatcca gttccaagtc tggagagagg catctttatc	300
ttattaaagt atcgagagac aaaatatcag acagcaatga ccaagagtca gcaaattgtg	360
atgcaaaaagg gctatcaaag ggaggctttt tacagagaac taaggagag aaggaggttg	420

ttaaagagac	ttgagatcag	aaaaagatca	agaacaactt	gaatctcaaa	gtatgaattt	480
gaagtatttt	gctgagcaaa	catttgaaatg	cctgtatgta	ccgtaatcct	ctatcactgg	540
ggcccccaac	cccgtacca	gcccgtggcc	tgctagggac	tgggcccgcac	agcaggagggt	600
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tangttgcaa	cgcttcctta	tgagaanttg	aatgcctgan	ngaactgtca	ctgncttcca	780
tnaaccacca	gatgggtact	ngttc				805

<210> 787

<211> 775

<212> DNA

<213> Homo sapiens

<400> 787

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agcctgagcc	aacataacaa	gactttgtct	ctaaacaaaa	cagttattgt	ttaaagaatc	180
tgaaatcttc	atctttaatt	caggtagcac	cgactcgagc	ccaagtttgt	ttgatatacca	240
gttccaagtc	tggagagagg	catctntatc	ttattaaagt	atcgagagac	aaaatatcag	300
acagcaatga	ccaagagtca	gcaaattgtg	atgcaaaagg	gctatcaaag	ggaggctttt	360
tacagagaac	taaggaagag	aaggagggtg	ttaaagagac	ttgagatcag	aaaaagatca	420
agaacaactt	gaatctcaaa	gtatgaattt	gaagtatttt	gctgagcaaa	catttgaatg	480
cctgtatgta	ccgtaatcct	ctatcactgg	ggcccccaac	cccgttacca	gcccgtggcc	540
tgctagggac	tgggcccgc	cagcaggagg	tgagcagngg	gtgggcaagc	cgaccattcc	600
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ccctattgta	aactgccatg	cnagggatct	aggttgacag	ctccttatga	ggaattgaat	720
gcctgatga	acttgnact	gncttccatc	acccccagaa	nnganctggc	taacc	775

<210> 788

<211> 774

<212> DNA

<213> Homo sapiens

<400> 788

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tagtcattat	ggcagcagct	tctgatgttt	ttgtttggta	ggttttctga	tttcaatata	180
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tactcaacat	ggaaaatgga	gcctatttgc	aaacacacaa	gtaattaaag	taccaattct	360
ctcttagttt	ctttttttat	agttggttta	ttttgcaatt	ataaatgtta	aacatcccta	420
gagatgaaag	ttaaaatggg	tgatcacaga	tcagtagcaa	aatacaaat	gacaattcaa	480
aattataaat	aaaactctgt	tgaggatgtt	taactttgag	tctccaaatt	taagagctaa	540
gcttggaga	aacaaattta	taggttatat	ttccctctta	aattaaanaa	acaaacttcc	600
tctggcagta	gtttggtgaa	ttcctttcat	tgnaatgata	ccatgattac	aggatcaaaa	660
atgcttaact	tacttgccat	tctgtctaca	tcacacagag	ttgttntttt	tttaaagcac	720
tcnatgtagg	cattttaaac	cttcnggata	accagagtat	cttttgagaa	annc	774

<210> 789

<211> 773

<212> DNA

<213> Homo sapiens

<400> 789

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attcgaattc	ggcacgagag	cagatttgng	ataaacntnn	tgnaggttna	accnaagggg	120
aactnntggt	gcaactatgn	ngnttggaag	atgctgcnta	tgtttattga	ggattgcann	180
anananatcc	tgaatnctcg	ccntttncaa	aggcttggat	aaagcactca	agccagctac	240
atatgtatag	aacggnttaa	aatcnatgag	gaagcctgga	ctaaatatnc	catnggactg	300
gngccnanaa	ngctgncgat	gaactttgna	tctggnnaga	agtntaaaga	atggcaggat	360
nantnntctaa	ngatgaattt	cannacnggn	nnnccaccan	tcttnaatnc	tttaagatca	420
ttatacgaag	ncnangaaaa	ggtggcaatc	atngaanaat	gngnatnatg	ttangaaacc	480
tctctaaaaa	gntgacggca	ctttaacccc	natgatgatg	ggaaggaggn	accaccaacc	540
acattanttt	ngggtccagt	actacttggc	acanccttat	nacgaaactg	gncngtncnt	600
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nctctttntc	anganagctn	nngatccata	ngacntgctg	ganatnttta	aggaancttc	720
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<210> 790

<211> 953

<212> DNA

<213> Homo sapiens

<400> 790

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atgcttngtg	aagcctgann	ccaaanctna	agganaggac	ctggatcccc	ttatatngaa	180
naancggtn	ggaggaanga	gnntgtcngg	gaggatgggg	cagaaaatga	ngnnggcaga	240
ntggncccgg	gggctctgca	naccagcctt	ggagcctgct	cattctgggc	ccttgctgcc	300
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aacctgaaaa	tgcagctggt	anaatntcaa	tgggaagcat	aaatnecatg	aaaatataat	480
tnagntngaa	tatnanngta	aaaatgcact	tttnngcgg	gtgacngatc	ctggggnccc	540
annatctggn	attnaagngn	tttacnaang	gaanggaaag	gacctttnc	taaactacct	600
ttttgaacag	ancattaaga	angnnctt	ttttaagnaa	aaaaaatca	aattttgang	660
aaaantggna	ttngaattgn	nagaaaaang	gatananaan	aaaanccaat	nntaannacc	720
nannctctct	gganttcnac	tatctccact	acntacntnt	acntatngcg	ntaanatnna	780
ctnttaentc	nnntantcn	cacanaentc	ntcnaacnta	atnangcncn	canaatcctc	840
tatannatnt	antgtnnntc	acannncnna	cnggntaant	ntnnncaacg	ccatatcacc	900
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<210> 791

<211> 798

<212> DNA

<213> Homo sapiens

<400> 791

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ttagtgacat	agtaacatct	gtagcagctg	gttagtaaac	ctcatgtggg	ggtgggggtg	120
gggtgtatct	cttgggggat	ggtttgggcc	gaatggggag	tggaaatatt	gcnccttccc	180
tgttttaaat	tctaggatag	attttaacat	cctttgcggt	cccagtcocaa	ggtangetgg	240
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gtagcctact	gagttaatat	ttaagttgtc	aatagataag	tgtccctgtt	ttgtggcata	360
atataactga	atttcatgag	aagattttatt	ccaccanggg	tatttcannc	tttgaaacca	420
aatctgtgta	tctaatacta	acccaatctg	tttggatgtg	gatttttaaaa	aaatgtttgc	480
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ttntntnaacc	tcttggcctt	aaaatgcgtt	ttattctnga	taagatactt	cnaaatanc	600
tnncaaaagg	tgtnngatnc	naattacttt	aaaataaaaac	ctgtaattgn	ataatgncat	660
aatgntgntc	catgcctnan	tccccctcta	gnnntanaaaa	cntnantaan	aantatatca	720
atnntcgatn	aaatnntann	actataaaaa	ctnccggcct	cttananaact	tnatncttga	780
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<210> 792

<211> 788

<212> DNA

<213> Homo sapiens

<400> 792

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cagtgaggac	atgtgcgtgc	acttctttga	tgtggagcgg	gcggccaaag	ctgctgtcaa	180
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ctattgctta	atttgnnaac	cattntaaac	ctgcaaatga	aaccaagttt	aacaaccaan	660
caattggcan	ttcattttta	atggttttna	aggttcaagg	ggggaaggtt	tttgggaagg	720
tttttttaaa	attnncgggn	ccnnngngnc	ccaatgcatt	tggggccccc	ggnccccaaa	780
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<210> 793

<211> 806

<212> DNA

<213> Homo sapiens

<400> 793

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tgtgccatgg	ggcaaganac	nattttgccc	tctatggntn	tcttttaaaa	ttttcanttt	720
aaaaatacct	cttttnncag	gaatccta	tttggcnccg	aagcntattn	ntggtnccac	780
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<210> 794
 <211> 815
 <212> DNA
 <213> Homo sapiens

<400> 794

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ctttgnantc	tcactacttn	ggaangctga	ngcnatgaan	aatttgcttn	aacccnngga	660
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<210> 795
 <211> 1050
 <212> DNA
 <213> Homo sapiens

<400> 795

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ttctctgctc	caagacctgg	gtgtctacaa	ctgtgagccc	agcttgnccc	aaaggcagtc	180
cccatgggac	ctagactcac	cttnccttg	cctctatgaa	accttctgct	tgggcccanc	240
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ccagcnagcg	gncttcagcc	accgtcttcc	cctttcttcc	gggcccgtnt	tgtnagcanc	360
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cntgntcaca	atcaancatn	tatncctnan	ntnggggtatn	acnaatggcc	tnaagantgc	540
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ncatgnantn	ttagtntntg	atntanccnc	nattgcagcc	ncataattat	cctacaccac	660
anannaancc	ntccttnnag	aanntgnont	ctatgnaana	gnctnnnaat	gtggcnnena	720
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natanngnnn	anactnannn	ngtctctcnt	atnnnttatn	nanngntcan	nttacnnnan	960
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<210> 796
 <211> 884
 <212> DNA
 <213> Homo sapiens

<400> 796

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<210> 797

<211> 773

<212> DNA

<213> Homo sapiens

<400> 797

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<210> 798

<211> 812

<212> DNA

<213> Homo sapiens

<400> 798

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<210> 799

<211> 758

<212> DNA

<213> Homo sapiens

<400> 799

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<210> 800

<211> 770

<212> DNA

<213> Homo sapiens

<400> 800

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<210> 801

<211> 573

<212> DNA

<213> Homo sapiens

<400> 801

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<210> 802

<211> 1390

<212> DNA

<213> Homo sapiens

<400> 802

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<210> 803

<211> 947

<212> DNA

<213> Homo sapiens

<400> 803

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<210> 804

<211> 532

<212> DNA

<213> Homo sapiens

<400> 804

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<210> 805

<211> 552

<212> DNA

<213> Homo sapiens

<400> 805

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<210> 806

<211> 1646

<212> DNA

<213> Homo sapiens

<400> 806

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<210> 807

<211> 1029

<212> DNA

<213> Homo sapiens

<400> 807

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<210> 808

<211> 836

<212> DNA

<213> Homo sapiens

<400> 808

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<210> 809

<211> 1844

<212> DNA

<213> Homo sapiens

<400> 809

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<210> 810
<211> 489
<212> DNA
<213> Homo sapiens

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<400> 810
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ysrganaakr gmcmayycmy cwkcawcct swgncwmays tswrwcwrat ksmtkycykw 240
kccctattta tgtaaaaata cagggtccct gagccagcct aaggcataag tgacttatcc 300
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<210> 811
<211> 471
<212> DNA
<213> Homo sapiens

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<400> 811
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ccaattgcta tttttccgaa caatccttgt agagtatgta ccatccaaag gcaggagggc 420
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<210> 812
<211> 579
<212> DNA
<213> Homo sapiens

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<400> 812

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acttccagtc	tgggttctca	ataggagggc	cccgaacttc	tccctccag	tcattctctc	180
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gcacgtggna	ggagagtagg	cagatgtctg	gtgctcttta	agctcaaagg	catcatggcc	420
ctctckgnwg	sarcrrrsrs	akamragkym	sssatcncag	scagcscwnk	arskstsgca	480
nwmwcatts	casmtgcasc	mmcmgrrrs	mkcsksywcm	kmagnsktnm	scmtsgsrgy	540
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<210> 813

<211> 562

<212> DNA

<213> Homo sapiens

<400> 813

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acacaccagc	ccacacactc	gcacacactc	acacgcacac	acccttccag	gaggggctgt	180
tggctgcctt	ggagtcccg	tagscctaaa	caagtgtatc	tgggcttgcc	aggcagttgt	240
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<210> 814

<211> 594

<212> DNA

<213> Homo sapiens

<400> 814

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cccaccccta	gccagcagct	cccagtcaga	caacagccag	awatgtctcc	agactctgcc	360
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<210> 815

<211> 812

<212> DNA

<213> Homo sapiens

<400> 815

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ggatttcacc	gtgtcaagat	tgggaatgct	ttttttttct	ttttcttggg	cattttacaac	180
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tgcgccagg	ggcgaggcgt	ccaggcccgt	tttgctcgtg	accgggcccc	tggccaagct	780
gccaggcatg	ggggaaccgt	agccggggta	gt			812

<210> 816

<211> 999

<212> DNA

<213> Homo sapiens

<400> 816

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<210> 817

<211> 653

<212> DNA

<213> Homo sapiens

<400> 817

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gcgacagaat	aatctcatta	gagctgctgc	aattttctgg	accatattgg	gggtctatag	180
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cttcattcat	agtttcaaca	gtckgcacag	catgtcccat	aattccggtc	acagacatgc	420
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cccatccttt	atactcattc	ttctcactgg	ctgtcactcg	gacctctttg	taaatgtaat	540
cttgccattc	taaggggcct	ttcttcaccc	attcactcat	gattgccacc	tggttaaate	600
agttaaaaaa	ctctcgcaa	ctctgggtac	tcagcaacca	tgctttgagg	aag	653

<210> 818

<211> 1225

<212> DNA

<213> Homo sapiens

<400> 818

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<210> 819

<211> 1024

<212> DNA

<213> Homo sapiens

<400> 819

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acaa 1024

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<210> 820
<211> 631
<212> DNA
<213> Homo sapiens

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<210> 821
<211> 635
<212> DNA
<213> Homo sapiens

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<400> 821
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<210> 822
<211> 752
<212> DNA
<213> Homo sapiens

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<400> 822
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<210> 823

<211> 899

<212> DNA

<213> Homo sapiens

<400> 823

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<210> 824

<211> 1980

<212> DNA

<213> Homo sapiens

<400> 824

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tcgttattat	aatgttagt	tctagctcta	tttacttcta	atcttaaatc	agaataaatt	1920
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<210> 825

<211> 333

<212> DNA

<213> Homo sapiens

<400> 825

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aacttgtgag	gttgagaaac	ttttcttaag	cttattggcc	attcaagttt	cctcctttat	240
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<210> 826

<211> 658

<212> DNA

<213> Homo sapiens

<400> 826

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caatttgtac	aactcagtgt	tatggcatcc	ggcagcaata	gtgtttgttc	cttattctct	180
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cagtaatgac	gttacaattt	gtagcttaaa	ctcaataact	ttaaggtcca	catatccagt	360
ttactttgaa	aactaaagat	gttttaaaac	ttcatgaata	catcaacctg	aggagtattt	420
taggkcccaa	atccagtttt	ttaatttata	ctccacnaaa	aangaaaata	catacataaa	480

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awtttaaacc mcngttytgg gccattwaa acaccmaaaa agacccccn aaaagttaag      540
anttcagct tanttctgga ngggtgggnc aaaatarraw kktwtawwma wwwymytwwt      600
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<210> 827
 <211> 453
 <212> DNA
 <213> Homo sapiens

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<400> 827
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cataaaaatta accatcacaa ccatgttcta ggcactgttc ctactgcctt gagaagacac      180
cgttatgttt attagggttt ttgagtttta tccacagctt ttggttatct gcaaccatgt      240
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acttcttcac agtccatctg gttttgtaga gggaacataa ctggacattc tggtcagggt      360
aggtgagggtc aggccttcag gacgctatct tctactgagtt gctttataag gcacattatg      420
caaaattcca tcagctcttc tgttcactac att                                453
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<210> 828
 <211> 657
 <212> DNA
 <213> Homo sapiens

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<400> 828
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cacatcgcac agtcacaggg gcaaagcccc tgaaaaaggc tgtggtgatg cccctacagc      180
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gcgtggaggg cataacgggg aaacagatgg agtccttcct gaaggcaaac atcctgggtc      540
tcgcccggcg ccagcgtgtg ggcgcctcct gaccgtcgct tcctcactcc gccttttcaa      600
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<210> 829
 <211> 775
 <212> DNA
 <213> Homo sapiens

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<400> 829
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gtaagacacc aaacacacac ctcatctcct gaactgtgac ttccaagctg acatttttct      180
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aacatgatac ctttaacttc ttttgagcag gctggatctc aggtcatta tctttttcca      420
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cagtagcaat	aggagtacta	caaggaatct	gggggtgcaca	ctctctgttg	ggctttcctg	660
aggtctctcc	actttgttcc	atctcttcag	aagtttcttg	ctttgcttta	aacaatctat	720
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<210> 830
 <211> 413
 <212> DNA
 <213> Homo sapiens

<400> 830						
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gcagcagcag	cagacctatg	gtgccatcca	caacatcagc	gggactatcc	ctggacagtg	180
cttggecgak	agcsmcasgk	gcagtgtggc	ntgctgcccc	ccaggaggcc	tgaggctggg	240
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<210> 831
 <211> 876
 <212> DNA
 <213> Homo sapiens

<400> 831						
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<210> 832
 <211> 768
 <212> DNA
 <213> Homo sapiens

<400> 832						
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tgtgttggg	tttattacta	gttcagatga	gtggctgctg	aaggggcccc	ctgtgcattt	360
tcattataac	ccaatttcca	cttatttgaa	ctcttaagtc	ataaatgtat	aatgacttat	420
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tcatgcatta	agactgtttt	caaagctttc	ctcacatttt	taaagtgtga	ttttcctttt	660
aatatacata	tttattttcy	ttaaagcagc	tatatcccaa	cccatgactt	tgggrgatat	720
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<210> 833

<211> 1604

<212> DNA

<213> Homo sapiens

<400> 833

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<210> 834

<211> 617

<212> DNA

<213> Homo sapiens

<400> 834

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<210> 835

<211> 542

<212> DNA

<213> Homo sapiens

<400> 835

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<210> 836

<211> 542

<212> DNA

<213> Homo sapiens

<400> 836

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<210> 837

<211> 719

<212> DNA

<213> Homo sapiens

<400> 837

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<210> 838

<211> 579

<212> DNA

<213> Homo sapiens

<400> 838

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<210> 839

<211> 1172

<212> DNA

<213> Homo sapiens

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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09/217,471	21 December 1998 (21.12.98)	US	
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		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
		Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
		(88) Date of publication of the international search report: 23 December 1999 (23.12.99)	
(54) Title: HUMAN GENES AND GENE EXPRESSION PRODUCTS I			
(57) Abstract			
<p>This invention relates to novel human polynucleotides and variants thereof, their encoded polypeptides and variants thereof, to genes corresponding to these polynucleotides and to proteins expressed by the genes. The invention also relates to diagnostic and therapeutic agents employing such novel human polynucleotides, their corresponding genes or gene products, e.g., these genes and proteins, including probes, antisense constructs, and antibodies.</p>			

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INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 98/27610

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/12 C07K14/47 C07K16/18 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N C07K C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>CARMECI, C. ET AL.: "Identification of a gene (GPR30) with homolgy to the G-protein-coupled receptor superfamily associated with estrogen receptor expression in breast cancer." GENOMICS, vol. 45, no. 3, 1 November 1997 (1997-11-01), pages 607-17, XP002099963 abstract page 608, left-hand column, paragraph 3</p> <p style="text-align: center;">---</p> <p style="text-align: center;">-/--</p>	1-7

☒ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

* Special categories of cited documents :

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- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

15 April 1999

Date of mailing of the international search report

11. 11. 99

Name and mailing address of the ISA

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Authorized officer

Smalt, R

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/27610

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	YEATMAN, T.J. ET AL.: "Identification of genetic alterations associated with the process of human experimental colon cancer liver metastasis in the nude mouse." CLINICAL AND EXPERIMENTAL METASTASIS, vol. 14, no. 3, May 1996 (1996-05), pages 246-252, XP002099961 abstract ---	1-7
X	NUCLEIC ACID RESEARCH, vol. 23, no. 19, 1995, pages 4007-8, XP002099962 cited in the application the whole document ---	1-7
A	RADINSKY, R. ET AL.: "Level and function of epidermal growth factor receptor predict the metastatic potential of human colon carcinoma cells." CLINICAL CANCER RESEARCH, vol. 1, January 1995 (1995-01), pages 19-31, XP002099964 the whole document ---	
A	BALDI, A. ET AL.: "Differential expression of the retinoblastoma gene family members pRb/p105, p107, and pRb2/p130 in lung cancer." CLINICAL CANCER RESEARCH, vol. 2, July 1996 (1996-07), pages 1239-45, XP002099965 the whole document -----	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 98/ 27610

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION SHEET

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

SEE ADDITIONAL SHEET

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-7

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: Invention 1: claims 1-7

A library of polynucleotides comprising the sequence information of at least one of the sequences 1-844.

2. Claims: Invention 2: claims 8,13-19,21 all partially

The isolated nucleic acid with seq.ID 1, sequences with at least 90% sequence identity therewith and degenerate variants thereof, host comprising said nucleic acid, peptide encoded by said nucleic acid, antibody against said protein, vector comprising said nucleic acid, and a method for detecting the differential expression of said nucleic acid.

3. Claims: Inventions 3-845: claims 8-22, all partially,
as far as applicable

As invention 2, but limited respectively to the seq.ID's 2-844

For the sake of conciseness, the second subject matter is explicitly defined, the subject matters of inventions 3-845 are defined by analogy thereto.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

In view of the large number of libraries, which are defined by the general definition in the independent claim 1, the search had to be restricted for economic reasons. The search was limited to the libraries for which data was given in the description, or libraries derived from cell lines mentioned in table 4 of the description, and to the general idea underlying the application (see Guidelines, Part B, Chapter III, paragraph 3.6).